Nonfinancial disclosure and analyst forecast accuracy

Nonfinancial Disclosure and Analyst Forecast Accuracy: Evidences from CO_2 Emission and Corporate Social Responsibility Disclosures in the US

Lorenzo Dal Maso[†] and William Rees[‡*]

† Erasmus University Rotterdam, Erasmus School of Economics, Burgemeester Oudlaan 50, PO Box 1738, 3000 DR, Rotterdam (NL). Email: dalmaso@ese.eur.nl

‡ The University of Edinburgh Business School, 29 Buccleuch Place, Edinburgh EH8 9JS, UK. Tel.: +44 (0) 131 651 5244. *Corresponding author: bill.rees@ed.ac.uk.

Keywords: CO_2 Emissions Disclosure, Financial Analysts Forecast Error, Forecast Bias, Forecast Dispersion, Corporate Social Reporting, Propensity score matching.

This version: November 2016

Acknowledgments: We acknowledge helpful comments from the participants of the British Accounting and Finance Association Scottish Area Group (Edinburgh), XI Workshop on Empirical Research in Financial Accounting (Cordoba) and the 39th Annual Congress of the European Accounting Association Maastricht (NL).

Nonfinancial Disclosure and Analyst Forecast Accuracy: Evidences from CO_2 Emission and Corporate Social Responsibility Disclosures in the US

ABSTRACT

We examine the association with analyst forecast quality of both CO_2 emission disclosure and corporate social reporting for a sample of large US firms. Using a matched sample we find, for a one, two and three-year horizons, a significant reduction in error, bias and forecast dispersion and a significant improvement of the analysts' information environment for those firms that disclose CO_2 emissions. However, we confirm a significant negative association between corporate social responsibility reporting and forecast error only for a one-year horizon and bias for a one and two-year horizon. Previous work had demonstrated a significant negative association between forecast error and CSR disclosure for an international sample but not for the US. Our results suggest nonfinancial disclosure is relevant even in a liberal market economy with transparent financial reporting.

I. INTRODUCTION

We investigate the impact of disclosure of both Corporate Social Reporting (hereinafter CSR) and CO_2 Emissions Disclosure (hereinafter CED) on the accuracy, bias and dispersion of analysts' earnings forecasts and on the analysts' information environment. Prior research has suggested that CSR has a significant negative association with forecast error in many countries but a positive albeit insignificant association in the United States (Dhaliwal, Radhakrishnan, Tsang, and Yang 2012). We found that result puzzling. We also note that sell-side analysts exhibit considerably more interest in CED than other elements of non-financial reporting typical of the contents of a CSR document (Eccles, Serafeim, and Krzus, 2011). Our objectives are therefore to re-examine the contention that the US is a special case with regards to the importance of nonfinancial disclosures and whether CSR is a relatively blunt indicator of nonfinancial disclosures when contrasted with CED.

We contrast CO_2 emissions disclosures with the general aspects of corporate social reporting as we view environmental measures as more directly related to costs than the general elements of CSR, which may include important aspects of social or ethical behaviour but may be less relevant to earnings expectations. Indeed Eccles et al. (2011) provide evidence which suggests that broker-dealers, the source of earnings forecasts, are about ten times more likely to examine CED disclosures in Bloomberg than other elements of CSR for an international sample including the US. Whilst they also show that for their full sample of Bloomberg users CED is influential outside the US whereas governance measures tend to be more influential in the US, the magnitude of the dominance of CED for broker-dealers is too large to be explained by international differences. We therefore have evidence which suggests that the analysts producing earnings forecasts are more interested in CED than CSR and hypothesize that CED may be more important than CSR in explaining analyst forecast quality. Despite this apparent importance of CED we view such disclosure as an indicator of good environmental disclosure

in general in the same way that issuing a corporate social report can be seen as an indicator of good social reporting in general.

Prior research has demonstrated a statistically significant association between CSR and reduced forecast error for a large international sample largely comprising firms in developed economies (Dhaliwal et al. 2012). It is important to note that the US was an exception and indeed, of the 31 countries in their sample, only the US had a positive coefficient on the relationship between CSR and one-year horizon forecast error. The authors demonstrate that their overall result are weaker where firms operate in a liberal market economy and are subject to less transparent financial accounting but this result might also be driven by the US sample which makes up 40% on the total. Australia, Canada, and the UK all show significant negative association between forecast error and CSR. The authors note that in the US few firms provided CSR reports, they were relative short and rarely independently assured and it is possible that the result for the US, and for the liberal economies in general, given the US sample influence, are driven by limited commitment to CSR reporting in the US during the Dhahliwal et al. (2012) sample period. In our data the percentage of firms issuing reports jumped from 5 percent in 2006 to 30% in 2007, the last year included in the Dhahliwal et al. (2012) sample. Thus, there is a case for re-examining the previous results in the light of the substantial increase in the US use of CSR reports in the last decade.

Whilst it may readily be proposed that there is greater scepticism regarding corporate social responsibility in general in the US than in other developed economies we view the argument that social costs have a less profound impact on firms in the US than in other developed economies as more contentious. It is certainly possible that the legal and regulatory environment can affect whether social costs are born by the firm or not. It is also probably that many of the costs and benefits of corporate social responsibility are similar for US and European firms. This is an empirical question which we do not address here other than to test

the contention that CSR reports are not associated with financial analysts' information environment in the US.

However, as acknowledged by Dhaliwal et al. (2012), attitudes to climate change, and hence the impact on the financial performance of climate change, are particularly sceptical in the US. This contrasts with the previously cited results from Eccles et al. (2011) which suggests that carbon disclosures are of considerable interest to financial analysts. Carbon disclosures are typically made via CDP, GRI or occasionally via self-made reporting. The requirements of the CDP and GRI procedures are closely defined and constrain the firm rather more than the largely unregulated CSR. The firm has to complete a series of explicit questions concerning, strategy, governance, emissions and targets which may well end up as a 100-page document and the level of reporting and carbon emissions performance are assessed and graded by CDP. In our sample the percentage of firms issuing carbon disclosure reports climbs from 15 percent in 2003 to 36 percent in 2009. Given that CED is more common than CSR, at least in the early years of our sample, and CED is more highly controlled than CSR it is feasible that CED is a stronger indicator of the information environment than CSR. We are therefore interested to re-examine the role of CSR in general, and CED in particular, in the US given the surprising (for us) prior evidence that CSRs are not significantly related to the analysts' information environment in the US.

In our empirical analysis we expand the analysis to a broad investigation of the analysts' information environment from a unique focus on forecast error and also reconsider the empirical approach. We investigate the effect of CED and CSR on mean forecast error, as in previous papers, and both forecast bias and forecast dispersion. We include dispersion, as it is possible that mean forecast error might be driven by bias, whereas low dispersion may accompany inaccurate consensus. If CED assists analysts in their forecasting activities it should both improve accuracy and reduce dispersion.

We base our conclusions on a propensity score matching approach (hereinafter PSM). The association, or lack of it in the US, between CSR and forecast error is robustly demonstrated in the previous literature but it is clearly conceivable that any causal relationship may be exaggerated or reduced by endogeneity.

For our sample of up to 2,725 firm-years observations drawn from 2003 to 2009, using PSM approach, we find a negative and statistically significant relationship between total emissions disclosure and forecast error, bias and dispersion for all forecast horizons from one to three years ahead. The relatively short window is constrained by data availability before 2003 and changes in regulation after 2009 when elements of carbon disclosure became regulated. In addition, our regression results, which are based on the matched sample resulting from PSM, reveal that CSR reporting is negatively correlated with forecast error, bias and dispersion albeit with unstable and weak statistically significance which lead us to support Dhaliwal et al.'s (2012) previous results.

Thus we report evidence that is consistent with CED reducing earnings forecast errors, but it remains possible that CED is a surrogate for other firm specific characteristics that reflect the information disclosure environment of the firm or the incentives for analysts to produce accurate forecasts, although our main analysis control for several firm's level governance characteristics. While this does not rule out alternative explanations playing a roll it remains consistent with CED providing information to analysts regarding future costs and benefits for the firm where emission emissions are important.

Whilst investors and analysts may be interested in CED for various reasons, including ethical as well as investment related, our focus on earnings forecasting implies that our results are driven by the impact of these disclosures on the information set available to analysts for financial decision making. Thus if CED helps analysts to produce better forecasts of earnings it would appear to be driven by the utility of these disclosures for identifying future costs and/or

benefits. It could be argued that firms choosing to disclose nonfinancial information are those where there are greater incentives to the analysts to produce accurate forecasts or that these firms are the sort of firms that provide better financial disclosures. This is difficult to refute but we contend that our empirical approach provides convincing evidence that the information environment of the disclosures which facilitates better forecasting.

Our research provides evidence that CEDs are indeed important for financial analysts and supports previous evidence that analysts pay more attention to emissions disclosures than other non-financial characteristics of firms. We are also able to demonstrate that even in the US, an environment thought relatively un-receptive to corporate social reporting, such disclosures are important for financial decision making. Our results point to future possibilities for research as we do not comment on the costs or benefits of CED and the resulting improvement in earnings forecasting. These costs and benefits may fall on the analysts themselves, corporate executives, investors or society in general. It may well be that forecast accuracy is a relatively minor element of these costs and benefits but our results are clearly inconsistent with CED being irrelevant.

The remainder of this paper is organized as follows: the next section presents the literature review, while in the third section we present sample, model and variables. In section four, we present results of the data analysis, while in section five we discuss the findings and implications of this study.

II. LITERATURE REVIEW

Over the last decade an increasing number of firms have adopted CSR disclosure (Campbell, Moore, and Metzger 2002; Peloza and Shang 2011; Zhang, Tong, Su, and Cui 2015) and this has stimulated studies regarding the role CSR plays in firms' valuation (Moser and Martin 2012). Our sample shows that less than 3 percent of US firms published CSR reports in 2003

whereas almost 30 percent did in 2009. Dhaliwal, Li, Tsang and Yang (2011, 2014) demonstrate that firms engaged in CSR strategies generally benefit from a lower cost of equity capital; Kim, Park and Wier (2012) reports lower earnings management; Jo and Harjoto (2014) find higher analyst following; Ioannou and Serafeim (2015) find more favourable analysts recommendation; and Dhaliwal et al. (2012) report higher analyst forecast accuracy in general – but not in the US.

Dhaliwal et al. (2011) examine the relation existing between voluntary disclosure of CSR activities and the firms' cost of equity capital. With a sample of US firms during the span 1993 to 2007 they find that firms with a high cost of equity capital in the previous year tend to initiate disclosure of CSR activities in the current year and that initiating firms with superior social responsibility performance enjoy a subsequent reduction in the cost of equity capital. Yet when Dhaliwal et al. (2014) extend their analysis to an international setting, with a sample of 5,135 standalone CSR reports published by 1,093 unique firms from 1995 to 2007 across 31 countries, they find that disclosure on social issues is negatively associated with the cost of equity capital and that this negative association is stronger in countries that are more stakeholder-oriented. The authors also find that initiating firms with superior CSR performance attract dedicated institutional investors and analyst coverage and achieve lower absolute forecast errors and dispersion.

With particular relevance to this study Dhaliwal et al. (2012) use a cross-country sample from 1994-2007 and they analyse the relation existing between the presence of a stand-alone CSR report and analyst accuracy (measured by analysts forecast error). They find that the issuance of a stand-alone CSR report is significantly associated with lower analyst forecast errors. Moreover, they also interact the stand-alone presence of CSR report with different country-variables; as a result, they provide evidence that CSR accompanies lower forecast error in countries with a stronger stakeholder focus and for firms and countries with more opaque

traditional financial disclosures. Dhaliwal et al.'s (2012) results could be explained by Kim et al. (2012) who find that socially responsible firms are less likely to manage earnings, to manipulate real operating activities, and to be the subject of SEC investigations hence delivering more transparent and reliable financial information to investors as compared to firms that do not meet the same social criteria. That is, socially responsible firms differ from other firms in their financial reporting and hence analyst accuracy is higher as a result of a reduction in earnings management.

Harjoto and Jo (2015), based on a sample of 2,034 US firms from 1993 through 2009, examine how the sell-side analysts interpret firms' CSR activities. Using the KLD strengths and concerns ratings, they examine the differential impact of overall, legal, and normative CSR on the analysts' earnings forecast dispersion, stock return volatility, cost of equity capital, and firm value. Overall CSR intensity reduces analyst dispersion of earnings forecast, volatility of stock return and cost of capital (COC), and increases firm value; moreover, legal (normative) CSR decreases (increases) analysts' dispersion, stock return volatility, and COC, while legal (normative) CSR increases (decreases) firm value.

Ioannou and Serafeim (2015), using a sample of US listed firms during 1993-2007, explore the impact of CSR ratings (i.e. KLD strengths and concerns rating) on sell-side analysts' assessments of firms' future financial performance. Their main result is that on the early '90s analysts issue more pessimistic recommendations for firms with high CSR ratings while during recent years there has been a progressively shift whereas analyst produce optimistically recommendations for firm with higher CSR rating.

However, these studies focus on the CSR reporting / performance while there is little evidence regarding the role of environmental disclosure in influencing analysts behaviours even if such disclosure is now becoming noteworthy for analysts (Eccles et al. 2011).

Clarkson, Fang, Li and Richardson (2013), through a sample of public U.S. companies from five polluting industries that report Toxics Release Inventory (TRI) data spanning from 2003 to 2006, discovered that voluntary environmental disclosure provides relevant information which enhances firm value. That said, *"Voluntary environmental disclosures provide incremental information useful for predicting future financial performance given a knowledge of current TRI"* (Clarkson *et al*. 2013, 430). Therefore, according to those authors, voluntary environmental disclosures can be viewed as *"an equilibrium outcome from a selection process and such disclosures enhance financial performance prediction [...] transparent voluntary environmental disclosures increase firm value provided that they are perceived as credible by investors and convey information incremental to what investors already know about the firm's environmental performance [...] to serve this role, once again, they have to be viewed as credible and convey incremental information"* (Clarkson *et al*. 2013, 411).

However, and in contrast to Clarkson et al. (2013), two recent papers (Matsumura, Prakash, and Vera-Munoz 2014; Saka and Oshika 2014) provide evidence of a negative relation between market value of equity and environmental disclosure. In particular, these are relevant because they use as an environmental disclosure proxy the value of carbon emissions, as provided by the CDP, in the US and Japanese market. Matsumura et al. (2014), using the S&P 500 during the span 2006 to 2008, investigate the effects on firm value of carbon emissions and of the act of voluntarily disclosing carbon emissions. Correcting for self-selection bias from managers' decisions to disclose carbon emissions, they find that, on average, for every additional thousand metric tons of carbon emissions, firm value decreases by $212,000, where the median emissions for the disclosing firms in our sample are 1.07 million metric tons indicating that the market penalizes all firms for their carbon emissions with a special impact on firms that do not disclose emissions information. Indeed *"with respect to its environmental*

activities, a firm's disclosure may provide competitors with information about particular production process inefficiencies, costing structures, expansion plans or product reliability. This information may allow competitors to gain an advantage over the firm in its relations with customers, suppliers or regulators" (Aerts et al. 2008, 646).

Similarly Saka and Oshika (2014), using a Japanese sample of 150 firms during 2006 up to 2008, examined the impact of corporate carbon emissions and disclosure on corporate value. They find that corporate carbon emissions have a negative relation with the market value of equity, the disclosure of carbon management has a positive relation with the market value of equity, and the positive relation between the disclosure of carbon management and the market value of equity is stronger with a larger volume of carbon emissions.

Therefore, these results are consistent with the argument that capital markets impound corporate social reports, carbon emissions and the act of voluntary disclosure of this information in firm valuations (Matsumura et al. 2014). However, stock market participants relay on information gathered and analysed by financial analysts, perceived as capital markets' gatekeepers (Aerts et al. 2008). Thus, since Aerts et al. (2008) find that environmental disclosure is associated with a decrease in analysts' forecast dispersion both in continental Europe and in North America; we should expect a positive valuation of such disclosure. With our research we shed light on the understanding of how analysts perceive CSR in general and CED in particular and how this information impacts on their valuation methods.

III. SAMPLE, VARIABLES AND ECONOMETRIC MODEL

3.1. Sample selection

This study combines accounting and environmental information data taken from Worldscope and ASSET4 via Datastream with analyst data are from the Institutional Brokers' Estimate System (I/B/E/S).

Previous studies that used CED as a variable of interest collected information from the Carbon Disclosure Project[1] (CDP) dataset (e.g Luo, Lan, and Tang 2012; Tauringana and Chithambo 2015; Peters and Romi 2014; Matsumura et al. 2014). As ASSET4 has fully incorporated the Carbon Disclosure Project (CDP) dataset in October 2012[2], in our study we use the value of total CO_2 and CO_2 equivalents emission in tons as CED data.

Our analysis includes all the US firms followed by ASSET4 from 2003 to 2009.[3] We choose a single country sample as a) we are motivated in part by the anomalous US result from Dhaliwal et al. (2012), b) in using one country we can abstract from the impact of country characteristics over regression results and c) because carbon disclosure is regulated, and often mandated, differently worldwide[4]. Over the last 20 years a number of mandatory or voluntary government schemes have emerged which require or encourage enterprises to measure and report their GHG emissions (Kauffmann, Less, and Teichmann 2012). In September 2009 the US Environmental Protection Agency (EPA) issued a rule for mandatory reporting of GHG for suppliers of fossil fuels or industrial GHG, manufacturers of vehicles and engines, and in general facilities that emit 25.000 metric tons, or more, of GHG emissions per year (starting in September 2011 for year 2010). Our sample is restricted to year end (i.e. December) 2009 as the provision of carbon information is on a voluntary basis up to that date.

Table 1 reports the sample derivation from the initial dataset of 10,070 firm-year observations, we removed firms with: a) fiscal year closing date different from the 31st of December and b) missing accounting, market and environmental data. Our resulting sample contains 2,725 firm-year observations (597 firms) spanning from 2003 to 2009 distributed as

[1] The CDP, an independent not-for-profit organization acting on behalf of hundreds of institutional investors, holds the largest repository of carbon emissions information (Source: https://www.cdp.net/en-US/Pages/About-Us.aspx). For a detailed list of academic research that use CDP as main dataset, see the dedicated internet web page: https://www.cdp.net/en-US/Results/Pages/academic-data.aspx.

[2] Useful information regarding the list of variables ingested by ASSET4, see Datastream Extranet Source: http://extranet.datastream.com/news_events/newweb/OctDec_2012/ContentEnhancement/CE5.pdf

[3] The North America list of firms followed by Asset 4 (LARGNNA) includes both US and Canada firms. Since Canada and US have different legislation on Carbon Disclosure we dropped Canadian firms.

[4] For a detailed overview of worldwide GHG reporting rules see Kauffmann et al. (2012).

shown in Table 2. The sample size grows steadily from 208 in 2003 to 583 in 2009, and the proportion of firms publishing CSR grows from 2 to 30 percent and CED disclosers increase from 14 to 36 percent.

[Insert Table 1 & 2 about here]

3.2. Dependent variable: Analyst forecast accuracy and dispersion

In our study, the initial variables of interest are analysts' EPS Forecast Error, Dispersion and Bias. Following Dhaliwal et al. (2012) we use analyst forecast errors as an inverse measure of forecast accuracy while following Athanassakos and Kalimipalli (2003) we use the standard deviation of analysts' forecasts as the dispersion measure. All the variables used to measure error, bias and dispersion (see appendix A and B) are taken from IBES in order to increase the comparability. Forecast *Error* is defined as the absolute value of the difference between the mean EPS forecast and the realized EPS; *Bias* is the difference between mean EPS forecast and the realized EPS while *Dispersion* is the standard deviation of mean EPS forecast. All these three dependent variables are scaled by the stock price at the date of forecast issuing, as provided by IBES[5] and showed in Figure 1 (Behn, Choi, and Kang 2008)[6]:

(1) Error (j) = ABS [EPS_mean_Forecast (j) – EPS_Actual (j)] / Price

(2) Bias (j) = [EPS_mean_Forecast (j) – EPS_Actual (j)] / Price

(3) Dispersion (j) = Standard Deviation of EPS_mean_Forecast (j) / Price

where *j* represents the forecast period: one, two and three year ahead. For each year we selected the forecast estimation provided by analysts on the third Friday of March to ensure that

[5] In order to preserve the number of observations included into the final sample, we replace 0 if the number of forecast was 1 and IBES reports the value of standard deviation as missing.
[6] Firm subscripts are suppressed

analysts have had enough time to obtain and analyze firm's financial and non–financial information (Ioannou and Serafeim, 2015) and we link the related error with the accounting and environmental information disclosed at the fiscal year end before the analyst made the forecast (see figure 1).

[Insert Figure 1 about here]

3.3. Empirical models

Following Dhaliwal et al. (2012), we consider Error, Bias and Dispersion function of CED/CSR and a set of control variables as follows:

Forecast error (j), Bias (j), Dispersion (j) = f (CED/CSR, control variables)

However, it is clearly probable that a standard pooled cross-sectional and time-series model of this type would be subject to endogeneity. This could come from a variety of sources but we are particularly concerned that omitted correlated variables would play a role. We use the PSM technique because the estimated results from non-matched samples would likely be biased by endogeneity between a firm's decision to report CED/CSR report and analysts' usage of such information.[7]

Using PSM provides greater assurance that the estimated results are not driven by omitted unobservable firm characteristics. PSM reduces reliance on the specification of the relation between variables (Rosenbaum and Rubin 1983). Therefore, we use the following logit model to estimate the determinants of a firm's decision to report CED/CSR and compute propensity scores for each firm in year *t* (firm subscripts are suppressed).

Following previous literature, we control for various factors that are likely to influence CED disclosure and CSR reporting. These are *CSR Index* is 1 if a firm reports on belonging to

[7] See Shipman et al. (2015) for a review of literature on this topic.

a specific sustainability index (e.g. Mackenzie, Rees, and Rodionova 2013), 0 otherwise; *Bribery* is 1 if the firm is at time *t* under the spotlight of the media because of a controversy linked to bribery and corruption, political contributions, improper lobbying, money laundering, parallel imports or any tax fraud, 0 otherwise; *Cross Listing* 1 if a firms is listed in more than 1 stock exchange, 0 otherwise; *Gov_Score* which measures the difference between firm *i* governance score over the minimum governance score for each industry-year (e.g., Francis et al., 2005); *ESI* is 1 if the firm belongs to any one of five environmentally sensitive industries (2-digit SIC: 13, 26, 28, 29, 33), 0 otherwise (Peters and Romi, 2014); *ROA* is the ratio between net income and lagged total asset; *Var_Earnings* is the natural logarithms of firm's net income, deflated by the number of shares, standard deviation based on the past three year rolling window[8]; *Loss* is 1 if the firm reports negative current earnings (Dhaliwal et al. 2012); *Analyst* is the number of estimates of EPS forecast as provided by IBES (Hope 2003; Dhaliwal et al. 2012; Jo and Harjoto 2014); *Size* the natural logarithm of lagged total asset (Dhaliwal et al. 2012); *Portion* is the ratio between firm's revenue at time t and the sum of industry (Dhaliwal et al. 2012) revenue for the same year; *Lev* is the lagged ratio between total debt and lagged total asset; *TobinQ* is the ratio between market value (i.e. market capitalization plus total value of debt) and lagged total asset; *Capex* is the ratio of capital expenditure over lagged total asset (Dhaliwal et al. 2012). Variable source and definition are provided in appendix A and B.

$$\begin{aligned}(a)\ CED_t / CSR_t = {} & \beta_0 + \beta_1\, Analyst\ FY\ (j) + \beta_2\, Bribery_t + \beta_3\, Cross\ Listing + \beta_4\, Gov\_Score_t \\ & + \beta_5\, ROA_t + \beta_6\, CSR\ Index_t + \beta_7\, ESI + \beta_8\, Var\_Earning_t + \beta_9\, Loss_t + \beta_{10}\, Size_t \\ & + \beta_{11}\, Portion_t + \beta_{12}\, Leverage_t + \beta_{13}\, TobinQ_t + \beta_{14}\, Capex_t + Year\_Control + \varepsilon_t\end{aligned}$$

[8] Similar to Dhaliwal et al. (2012). However, we set the rolling window on three years, rather than 5 years, in order to preserve final sample.

We match observations using the odds ratio of the propensity score estimated from model (a) with a maximum *caliper* distance of 1 percent to ensure appropriate matching (Matsumura et al. 2014).[9] We impose a common support by dropping treatment observations whose propensity score is higher (lower) than the maximum (the minimum) propensity score of the controls. Next, once obtained the frequency weight from the psmatch procedure, we estimate the following OLS model on the matched sample:

$$\begin{aligned}(b)\ Accuracy_t = {} & \beta_0 + \beta_1 CED_t + \beta_2 Bribery_t + \beta_3 Cross\ Listing + \beta_4 Gov\_Score_t + \beta_5 ROA_t \\ & + \beta_6 CSR\ Index_t + \beta_7 ESI + \beta_8 Var\_Earning_t + \beta_9 Loss_t + \beta_{10} Analyst\ FY\ (j) \\ & + \beta_{11} Size_t + \beta_{12} Portion_t + \beta_{13} Leverage_t + \beta_{14} TobinQ_t + \beta_{15} Capex_t \\ & + Year\_Control + \varepsilon_t\end{aligned}$$

$$\begin{aligned}(c)\ Accuracy_t = {} & \beta_0 + \beta_1 CSR_t + \beta_2 Bribery_t + \beta_3 Cross\ Listing + \beta_4 Gov\_Score_t + \beta_5 ROA_t \\ & + \beta_6 CSR\ Index_t + \beta_7 ESI + \beta_8 Var\_Earning_t + \beta_9 Loss_t + \beta_{10} Analyst\ FY\ (j) \\ & + \beta_{11} Size_t + \beta_{12} Portion_t + \beta_{13} Leverage_t + \beta_{14} TobinQ_t + \beta_{15} Capex_t \\ & + Year\_Control + \varepsilon_t\end{aligned}$$

In our study CED and CSR are taken from ASSET4 and represent, respectively, the total CO_2 and CO_2 equivalents emission in tons (ENERDP023) and if the company publish a separate sustainability report or publish a section in its annual report on sustainability (CGVSDP026). With respect to emissions, we use total CO_2 and CO_2 equivalents emission instead of other different measures available on ASSET4 (e.g. Scope1, Scope2 or Scope3

[9] In our main specifications, we adopt the single nearest-neighbor matching method as this produce an integer frequency of the weight used in the second stage of our analysis. We check the robustness of our main results by using alternative matching method such as Radius, local linear regression and 5 neighbors. Untabulated results reveal that our main analysis is consistent even using different matching approaches.

equivalent emission)[10] because the lack of common standards in measuring different firm's operational emissions may add some biases into our analysis.

We convert the disclosure proxy into a dichotomous variable. In fact, since we are interested on disclosure *per se'* rather than the value disclosed, we set CED=1 if firm *i* discloses at time *t* its value of total CO_2 and CO_2 equivalents emission, while we use CED=0 if firm *i* has an environmental score provided by ASSET4 at time *t* and, contextually, does not have any value of emission for the same period. In doing so, we are sure that firm *i* is followed by ASSET4 but does not disclose emission information for that specific year.

In contrast to Dhaliwal et al. (2012), who control for firms level of earnings management using a measure of firm-level financial transparency measured by country-, industry-, and year-adjusted total scaled accruals based on that of Bhattacharya et al. (2003), we use *Gov_Score*, *Bribery* and *CSR Index* as potential substituting proxies of accounting quality for the following twofold reasons. As a first measuring the abnormal accruals level would have been limited our sample more than using Asset4 ready to use governance variables, and then because we expect that controlling for level of governance performance score, or number of a controversy linked to unethical practice, or whether a firm belongs to a specific sustainability index can represent a valid alternative proxy for earnings quality.

IV. RESULTS

4.1. Descriptive statistics

[10] Companies report GHG emissions from sources they own or control as scope 1 (direct emission), emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by the reporting company are considered scope 2 (indirect emission) while scope 3 (mostly optional) covers all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions. For details over the three different measures of Scope, please see he GHG protocol "*A Corporate Accounting and Reporting Standard*" available at: http://www.ghgprotocol.org/standards/corporate-standard and "*Corporate Value Chain (Scope 3) Accounting and Reporting Standard*" available at: http://www.ghgprotocol.org/standards/scope-3-standard.

Table 3 reports the descriptive statistics for the variables used in the regressions. All firm-level continuous variables are winsorized at the 1st and the 99th percentiles to reduce the potential effect of outliers. As reported in panel A, on average 25 percent of firms disclose CO2 emission while 17 percent use CSR reporting. As expected, on average errors, bias and dispersion (number of analysts) increase (decrease) with the increasing of the forecast period. That is, the higher the forecast period the lower the accuracy and the number of analysts producing forecast estimations. In addition, on average our sample present 10 percent of firms listed into a CSR index, 13 percent report a loss during the current year, 13 percent are under the spotlight of media for an "unethical" practice, 19 percent operate in an environmental sensitivity industry, while the governance performance score is 22.26.

[Insert Table 3 about here]

In panels B and C we report the differences in accounting and environmental data across the two samples of disclosers and none. If we consider the two groups we can see that, on average, carbon emissions disclosures and corporate social reporters both are less likely to be loss making (significant only for CED), are more dominant in their markets, are more likely to be in an environmentally sensitive industry ($p<0.01$). Most significantly the disclosing firms have a higher number of analyst producing forecast ($p<0.01$), lower forecast errors ($p<0.01$ for emission disclosures) and dispersion ($p<0.01$ for CSR disclosures) at all three horizons.

The descriptive statistics presented above generally support the use of a PSM matched sample. The differences across the two sub-samples indicate the importance of appropriately matching observations and controlling for a number of differences that could complicate statistical inferences.

The correlation matrix is presented in table 4. Consistent with previous literature (Prado-Lorenzo, Rodríguez-Domínguez, Gallego-Álvarez, and García-Sánchez 2009; Luo et

al. 2012; Peters and Romi 2014), carbon emission disclosure and CSR reporting are positively (negatively) correlated, statistically significant at 1 percent, with CSR Index, Size, Bribery, Governance Score, Portion and ESI (Tobin Q and Loss). This means that the higher the firm's size, governance score, portion of revenues by industry-year the higher the probability to have a carbon emission disclosure and CSR reporting. Additionally, the positive correlation coefficients above suggest that CED and CSR disclosers are firms operating in Environmental sensitivity industry, included into a specific sustainable index, and under the spotlight of media for unethical practices. Finally, CED and CSR present different significance across DVs. Indeed are both negatively correlated with forecast errors, bias and dispersions (only CED), however only CED is statistically supported ($p<0.01$).

[Insert Table 4 about here]

4.2. Relation between CED/CSR reporting and analysts' accuracy

In the first stage of our analysis, we rerun a regression as in Dhaliwal et al. (2012)[11]. Unreported results show that the simple OLS method, without matched samples, produces negative coefficient on accuracy, bias and dispersion for both CED and CSR but with a weak significance unstable across FY1-FY3. We suspect that these results will be sensitive to endogeneity and believe that the PSM matched results will be more reliable.

Tables 5 to 7, report the logit matching regression results, the resultant distribution of the control variables across the matched samples and OLS regression results on the matched samples. Table 5 (Panel A to C) demonstrates that the predictive model determinants of CED and CSR used in the LOGIT model are statistically significant at conventional levels, meaning

[11] That is, following authors, we run OLS regression model with year and industry control and standard error clustered by firm. Available upon request.

that in the first phase of matching procedure we control for several determinant of non-financial disclosure. The direct comparison of the average treatment effect for error, bias and dispersion shows that all three are significantly negative for CED at FY1, whereas error and bias are significantly negative for FY2 and FY3. Conversely for CSR we find significance only for bias at FY2 ($p<0.05$) while the others DVs across the three forecast horizons do not demonstrate a significant difference between the treatment and control samples. Indeed dispersion is higher in the treatment group than in the control group for both FY2 and FY3.

[Insert Table 5 about here]

The results in table 6 (Panel A to C) confirm that the control variables are closely matched between the treatment and control samples. The matching appears to be successful as the matched samples exhibit little imbalance (i.e. no statistical difference between the treated and the control group) between the main firm-specific variables employed in our multivariate analyses.

[Insert Table 6 about here]

In tables 7 we report the OLS regression results for all three horizons (Panel A to C). Again, we adopt regression model approach only for the matched sample using the frequency weight resulting from the Propensity Score Matching procedure above. There is a strong negative association between CED and analysts forecast error, bias and dispersion for all three forecast horizons (at conventional statistically significance). For CSR reporting there is also a negative correlation between CSR and analysts forecast error, bias and dispersion yet these results are statistically significant only at FY1, mostly insignificant otherwise. These results are consistent with our underlying hypothesis that carbon emissions disclose is a stronger

indicator of better information for forecasting than is corporate social reporting and are likely consistent with the results for the US reported by Dhaliwal et al. (2012).

[Insert Table 7 about here]

The analysis above shows that both CED and CSR are negatively associated with forecast accuracy whether measured directly by looking at forecast error, bias, or indirectly by examining forecast dispersion (significant only for CED). The results are clear as to which is the more powerful indicator. The results are consistent with Eccles et al. (2011), who suggested that brokers are more interested in CED information than general CSR.

4.3. Sensitivity tests

Our review of the literature suggests some variation is to be expected in the effectiveness of the model. As a first sensitivity check, we run the analysis by replacing median estimation of EPS forecast rather than the mean estimation. In doing so we reduce the impact of extreme values. Unreported results confirm our results in tables 5 to 7.

We then investigate whether our results are consistent when we estimate the models across firms for which we have data in all years. We are aware that using a selection criteria that requires dependent variables for the three different forecast horizon may leads to the introduction of a survivorship bias, but again unreported results prove that for the restricted sample results are the same (with a lower level of significance for error of CED in FY1).

In addition there could be a substantial variation in reporting practice within the industry. Indeed there are industries where the percentage of CED disclosure is less (above) than 10 percent (90 percent), by year. Therefore, we decided to remove such extremes values. Results are qualitatively similar to our main findings.

As a last check we test the robustness of our results by dropping all the observations before 2007. In fact, as table 2 shows, there is an increase in CSR reporting across 2006/2007. Is our idea that this change in practice can be mostly due to the release of the third generation of the GRI guidelines in 2006. Therefore, in order to avoid any possible influence arising from such exogenous shock, we drop from our main analysis all the firm-years observations before 2007. Untabulated results show that our main inferences are qualitative the same with a higher significance for results in Table 7 Panel A (either for CED or CSR).

4.4. Additional Analysis

Taken together, all the sensitivity above let us believe that our main inferences are reliable. However, we decide to use an alternative approach and we investigate whether CED and CSR influence the properties of analysts' information environment such as uncertainty. Rather than using forecast error, bias and dispersion we follow the approach of Lehavy, Li and Merkley (2011) and we focus on aggregate measures of overall and common analysts' uncertainty to test whether our variables of interest influence analysts' information environment. We define analysts' overall and common uncertainty using the following equations derived by Barron, Kim, Lim and Stevens (1998). In their study, Barron et al. (1998) built an empirical measures of the overall uncertainty as the sum of the idiosyncratic and the common uncertainty and the common uncertainty in analyst forecasts measured through the accuracy, the dispersion, and the number of analyst forecasts. Accordingly, our two measure of common and overall uncertainty are as follows:

$$(a)\text{Uncertainty}_{\text{All (j)}} = \left[\left(1 - \frac{1}{\text{Num}_{\text{Analysts (j)}}}\right) \text{x Dispersion (j)}\right] + \text{Accuracy (j)}$$

$$(b)\text{Uncertainty}_{\text{Common (j)}} = \frac{\text{Accuracy (j)} - \frac{\text{Dispersion (j)}}{\text{Num}_{\text{Analysts (j)}}}}{\text{Uncertainty}_{\text{All (j)}}}$$

where, Num_Analysts, Accuracy and Dispersion are, respectively, the number of analysts producing EPS forecast, the squared difference between the mean EPS forecast and the realized EPS and the standard deviation of mean EPS forecast for the FY *j*. In order to increase the comparability and decrease the influence of extreme values or potential nonlinear relation, we convert both measures of uncertainty as by-year decile rank specifications (e.g., Barron, Byard and Yu, 2008) while, in order to avoid any scale effect, we deflated uncertainty overall by the market price at the date of forecast. Additionally, similarly to Lehavy et al. (2011) we perform the analysis on the uncertainty measures only for those firms with at least two analysts following it in each forecast period (j) [12].

Table 8, Panel A to D, reports results for Overall (a) and Common Uncertainty (b). Panel A reveals that there is a statistically significant difference in both measures of uncertainty for firms that report both CED ($p<0.01$) while no statically support for CSR reporting firms. These results are also corroborated by regression results in Panel C and D. As reported CED and CSR are negatively associated with both measures of uncertainty with a higher magnitude and significance for overall uncertainty. In other words, firms disclosing CSR and CED reduce either the overall uncertainty on the analyst information environment or the common part of uncertainty shared by analysts however this result is statistically supported only for CE. Taken together, these results allow us to corroborate our initial idea of a positive benefit coming from the disclosure of non-financial information such as CED.

V. CONCLUSION

[12] In their article, Lehavy et al. (2011) required at least four analysts. However this would have reduced the final sample as only few analysts perform the EPS forecast three year ahead.

We examine the role of firms' nonfinancial disclosures, specifically CED and CSR reporting, in reducing analysts' earnings per share forecast error and dispersion. Whilst there is prior evidence that corporate social reporting is associated with lower forecast error for an international sample the results for the Unites States are anomalous. Although statistically insignificant on its own the United States is the only country for which Dhaliwal et al. (2012) report a positive relationship between CSR and forecast error. We are therefore concerned to establish whether or not this result is robust. Dhaliwal et al (2012) suggest that social costs are less influential in the US than in other countries, and would therefore expect a lesser impact but this explanation would be surprising if true. We therefore update Dhaliwal et al.'s (2012) evidence, extend the analysis to forecast dispersion as well as forecast bias, given that more accurate individual forecasts imply lower dispersion of forecasts, and use a PSM approach to test the relationship between nonfinancial disclosures and analysts' forecast accuracy.

We are also interested to examine the impact of CO2 emissions disclosure on analysts' forecast accuracy. Again this is driven by a result in the previous literature that we find surprising. Eccles et al. (2011) document a relatively strong interest in carbon emission by brokers, the source of analysts' forecasts, in contrast with other elements of social and governance information. For users of the Bloomberg information system other than brokers the researchers are able to show a clear difference between users based in the US and elsewhere. In the US the preponderance of users are more interested in governance related information than in social or environmental. For brokers the focus on CED is so strong that, although not reported, it is impossible for the dominance of CED over other forms of environmental, social and governance information to be explained by international differences. Again it is not clear how information regarding the total carbon emissions of firms would aid brokers in their assessment of the worth of firms or their calculation of future earnings. Even so the apparent focus on this data item apparently exists.

Using a sample composed of US firms for which we can establish their CSR and CED history during the period 2003-2009 and controlling for potential endogeneity concerns, we document that CED and CSR are both positively associated with analysts' forecast accuracy, although the CSR results are weakly related on forecast, with a special concerns for longer period. A direct comparison of forecast accuracy and dispersion shows that errors, bias and dispersion are lower where firms disclose carbon emissions (statistically significant at conventional levels) while it is slightly supported by statistical evidence when firms issue a CSR report. Our results mostly agree with previous finding of Dhaliwal et al. (2012) that CSR is slightly influential for analysts forecasts in the US and the ones of Eccles et al. (2011) who report that CED dominates more general CSR as a focus of interest for analysts.

Our interpretation of these results remains cautious. It is clearly possible that a standard pooled cross-sectional and time-series model of this type could be subject to endogeneity so we use the PSM technique to provides greater assurance that the estimated results are not driven by omitted unobservable firm characteristics. Even so in the absence of a clear explanation as to how CED and CSR impact on analysts' work in forecasting earnings we are tempted to look further for explanations of the association between forecast accuracy and nonfinancial disclosures.

REFERENCES

Aerts, W., D. Cormier, and M. Magnan. 2008. Corporate environmental disclosure, financial markets and the media: An international perspective. *Ecological Economics* 64: 642-659.

Athanassakos, G., and M. Kalimipalli. 2003. Analyst Forecast Dispersion and Future Stock Return Volatility. *Quarterly Journal of Business and Economics* 42 (1/2): 57-78.

Barron, O.E., Kim, O., Lim, S.C. and D.E. Stevens. 1998. Using analysts' forecast to measure proprieties of analysts' information environment. *The Accounting Review* 73(4):421-433.

Barron, O.E., Byard, D. and Y. Yu. 2008. Earnings surprises that motivate analysts to reduce average forecast error. *The Accounting Review* 83(2):303-325.

Bhattacharya, U., H. Daouk, and M. Welker. 2003. The world price of earnings opacity. *The Accounting Review* 78 (3): 641–678.

Behn, B. K., J. Choi, and T. Kang. 2008. Audit quality and properties of analyst earnings forecasts. *The Accounting Review* 83 (2): 327–349.

Campbell, D., G. Moore, and M. Metzger. 2002. Corporate philanthropy in the U.K. 1985–2000: some empirical findings. *Journal of Business Ethics* 39 (1): 29–41.

Clarkson, P.M., X. Fang, Y. Li, and G.D. Richardson. 2013. The relevance of environmental disclosures: are such disclosures incrementally informative?. *Journal of Accounting and Public Policy* 32(5): 410–431.

Dhaliwal, D. S., S. Radhakrishnan, A. Tsang, and Y. G. Yang. 2012. Nonfinancial disclosure and analyst forecast accuracy: International evidence on corporate social responsibility disclosure. *The Accounting Review* 87 (3): 723–759.

Dhaliwal, D.S., Li, O. Z., Tsang, A. and Y.G. Yang. 2011. Voluntary Nonfinancial Disclosure and the Cost of Equity Capital: The Initiation of Corporate Social Responsibility Reporting. *The Accounting Review* 86 (1): 59-100.

Dhaliwal, D.S., Li, O. Z., Tsang, A. and Y.G. Yang. 2014. Corporate social responsibility disclosure and the cost of equity capital: the roles of stakeholder orientation and financial transparency. *Journal of Accountability and Public Policy* 33: 328-355.

Eccles, R.G., G. Serafeim, and M.P. Krzus. 2011. Market interest in nonfinancial information. *Journal of Applied Corporate Finance* 23 (4): 113-128.

Francis, J.R., Khurana, I.K. and R., Pereira. 2005. Disclosure incentives and effects on cost of capital around the world. *The Accounting Review* 80(4): 1125–1162.

Harjoto, M., and H. Jo. 2015. Legal vs. Normative CSR: Differential Impact on Analyst Dispersion, Stock Return Volatility, Cost of Capital, and Firm Value. *Journal of Business Ethics*, 128: 1–20.

Hope, O. 2003. Disclosure practices, enforcement of accounting standards, and analysts' forecast accuracy: An international study. *Journal of Accounting Research* 41 (May): 235–272.

Ioannou, I. and G. Serafeim. 2015. The impact of corporate social responsibility on investment recommendations: analysts' perceptions and shifting institutional logics. *Strategic Management Journal* 36(7): 1053-1081.

Jo, H. and M. Harjoto. 2014. Analyst coverage, corporate social responsibility and firm risk. *Business Ethics: a European Review* 23 (3): 272 – 292.

Kauffmann, C., C.T. Less, and D. Teichmann. 2012. Corporate Greenhouse Gas Emission Reporting: A Stocktaking of Government Schemes, *OECD Working Papers on International Investment*, 2012/01, OECD Publishing: http://dx.doi.org/10.1787/5k97g3x674lq-en

Kim, Y., M. S. Park, and B. Wier. 2012. Is earnings quality associated with corporate social responsibility? *The Accounting Review* 87 (3): 761–796.

Lehavy, R., Li, F. and K. Merkley. 2011. The effect of annual report readability on analyst following and the proprieties of their earnings forecasts. *The Accounting Review* 86(3):1087-1115.

Luo, L., Y.C. Lan, and Q. Tang. 2012. Corporate Incentives to disclose Carbon information: Evidence from the CDP global 500 report. *Journal of International Financial Management & Accounting* 23 (2): 93-120.

Mackenzie, C., W.Rees, and T. Rodionova. 2013. Do Responsible Investment Indices Improve Corporate Social Responsibility? FTSE4Good's Impact on Environmental Management. *Corporate Governance: An International Review* 21(5): 495-512.

Matsumura, E.M., R. Prakash, and S.C. Vera-Munoz. 2014. Firm-value effects of carbon emission and carbon disclosures. *The accounting review* 89(2): 695-724.

Moser, D.V. and P.R. Martin. 2012. A Broader Perspective on Corporate Social Responsibility Research in Accounting. *The accounting review* 87(3): 797-806.

Peloza, J., J. Shang. 2011. How can corporate social responsibility activities create value for stakeholders? A systematic review. *Journal of the Academy of Marketing Science* 39(1):117–135.

Peters, G.F. and A. M. Romi. 2014. Does the Voluntary Adoption of Corporate Governance Mechanisms Improve Environmental Risk Disclosures? Evidence from Greenhouse Gas Emission Accounting. *Journal of Business Ethics* 125: 637–666.

Prado-Lorenzo, J.M., L. Rodríguez-Domínguez, I. Gallego-Álvarez, and I.M. García-Sánchez. 2009. Factors influencing the disclosure of greenhouse gas emissions in companies worldwide. *Management Decision* 47(7): 1133– 1157.

Rosenbaum, P. R., D.B. Rubin. 1983. The central role of the propensity score in observational studies for causal effects. *Biometrika* 70, 41-55.

Saka, C. and T. Oshika. 2014. Disclosure effect, carbon emissions and corporate value. *Sustainability Accounting, Management and Policy Journal*, 5(1): 22-45.

Shipman, J. E., Q.T. Swanquist, and R.L. Whited. 2015. Propensity score matching in accounting research. Working paper (http://ssrn.com/abstract=2392858).

Tauringana, V. and L. Chithambo. 2015. The effect DEFRA guidance on greenhouse gas disclosure. *The British Accounting Review*, 47(4): 425-444.

Zhang, M., L. Tong, J. Su, and Z. Cui. 2015. Analyst coverage and corporate social performance: Evidence from China. *Pacific-Basin Finance Journal*, 32: 76–94.

Appendix A - Variable identification

Variable	Source	Code
Date of fiscal year end	Datastream	WC05350
Stock Exchange	Datastream	STOCK EXCHANGES LISTED
Industry	Datastream	INDUSTRY GROUP
Common shares outstanding	Datastream	WC05301
Market Price – fiscal year end	Datastream	WC05001
Total assets	Datastream	WC02999
Common shareholders' equity	Datastream	WC03501
Net income	Datastream	WC01706
Total debt	Datastream	WC03255
Net sales or revenues	Datastream	WC01001
Capital expenditure	Datastream	WC04601
Analyst EPS forecast	IBES (summary History)	Meanest
Analyst EPS forecast # Num. of estimates	IBES (summary History)	Numest
Analyst EPS forecast – St. Dev.	IBES (summary History)	Stdev
Analyst EPS forecast issuing date	IBES (summary History)	Statpers
Analyst EPS forecast period end	IBES (summary History)	Fpedats
EPS actual	IBES (summary History)	Actual
EPS actual report date	IBES (summary History)	Anndats
Stock price forecast issued date	IBES (summary History)	Price
Environmental Score	ASSET4	ENVSCORE
Governance Score	ASSET4	CGVSCORE
Bribery, Corruption and Fraud Controversies	ASSET4	SOCOO10V
CSR sustainability index	ASSET4	CGVSDP013
CO2 equivalents emission total	ASSET4	ENERDP023
CSR sustainability reporting	ASSET4	CGVSDP026

Appendix B - Variable Definitions

Variable	Description
CSR Index	1 if a firm reports on belonging to a specific sustainability index, such as FTSE4Good or DJSI, 0 otherwise.
CSR reporting (CSR)	1 if a company publish a separate CSR/H&S/Sustainability report or publish a section in its annual report on CSR/H&S/Sustainability, 0 otherwise.
Emission Disclosure (CED)	1 if firm *i* is at time *t* followed by ASSET4 (i.e. has a value of Environmental score) and discloses CO2 Equivalents Emission Total, 0 otherwise.
Bribery, Corruption and Fraud Controversies	1 if firm *i* is at time *t* under the spotlight of the media because of a controversy linked to bribery and corruption, political contributions, improper lobbying, money laundering, parallel imports or any tax fraud, 0 otherwise.
Gov_Score	Measured as the difference between firm *i* governance performance score (as provided by Asset4) over the minimum score for each industry-year (e.g., Francis et al., 2005).
Cross Listing	1 if a firms is listed in more than 1 stock exchange, 0 otherwise.
Var_Earning	Natural logarithm of standard deviation of a firm net income, deflated by number of share, on the rolling window [t-1,t-2,t-3]
Loss	1 if a firm reports negative earnings at time t, 0 otherwise.
Size	Natural logarithm of a firm's total asset at time t-1.
ESI	1 if a firm operates through an environmentally sensitive industries (i.e. 2-digit SIC codes 13, 26, 28, 29, 33), 0 otherwise. (Peters and Romi, 2014, p. 648)
Lev	Ratio between total value of debt and lagged value of total assets.
ROA	Ratio between net income and lagged value of total assets.
Capex	Ratio between capital expenditure over lagged value of total assets.
Portion	Ratio between firm's revenues over the total value of revenues calculated by industry-year.
TobinQ	Ratio between the sum of market capitalization (stock market price multiplied by the number of shares outstanding at the fiscal year end) and total debt over lagged value of total assets.
Bias FY 1,2,3	Difference between mean EPS one, two and three year ahead forecasted and EPS realized (as provided by IBES) scaled by the stock price at the time of issuance of the forecast (as provided by IBES).
Error FY 1,2,3	Absolute value of the difference between mean EPS one, two and three year ahead forecasted and EPS realized (as provided by IBES) scaled by the stock price at the time of issuance of the forecast (as provided by IBES)
Analyst FY 1,2,3	Is the natural logarithm of a number of analysts producing EPS forecast for each different period (as provided by IBES).
Dispersion FY 1,2,3	Is the EPS standard deviation of EPS forecast for each different period (as provided by IBES) scaled by the stock price at the time of issuance of the forecast (as provided by IBES).

Table 1: Sample selection criteria

10,070	All the US firm-year observations for firms included into the ASSET4 North America Constituent List **[i.e. 1,007 firms from 2000 to 2009]**
observations dropped	**reason for dropping**
863	Missing information on date of fiscal year-end
2,800	Fiscal year-end different from 31st of December
2,322	Missing accounting variables from Datastream
15	Missing market variables from Datastream
1,286	Missing environmental variables from ASSET4
59	Negative book value of equity
2,725	***Final sample – firm-year observations*** **[i.e. 597 firms from 2003 to 2009]**

Table 2: Sample distribution

	2003	2004	2005	2006	2007	2008	2009	Total
CED (0)	178	277	286	259	273	386	372	2,031
CED (1)	30	35	66	98	119	135	211	694
Total	208	312	352	357	392	521	583	2,725
CSR (0)	202	305	343	340	282	381	405	2,258
CSR (1)	6	7	9	17	110	140	178	467
Total	208	312	352	357	392	521	583	2,725
Dependent Variables								
Error FY1	207	301	344	353	389	513	575	2,682
Error FY2	207	301	343	353	389	512	573	2,678
Error FY3	163	229	300	329	371	458	535	2,385
Dispersion FY1	207	301	344	353	389	513	575	2,682
Dispersion FY2	207	301	343	353	389	512	573	2,678
Dispersion FY3	163	229	300	329	371	458	535	2,385
Bias FY1	207	301	344	353	389	513	575	2,682
Bias FY2	207	301	343	353	389	512	573	2,678
Bias FY3	163	229	300	329	371	458	535	2,385

Table 3: descriptive statistics

Panel A – dependent variables and firm control variables

Variable	Obs.	Mean	St. Dev.	Min	25°	Median	75°	Max
CSR Index	2725	0.0906	0.2872	0	0	0	0	1
Var_Earning[a]	2725	-0.5448	1.2237	-3.3171	-1.3700	-0.6178	0.1676	3.1448
Loss	2725	0.1317	0.3383	0	0	0	0	1
Size[a]	2725	16.1380	1.4075	13.3071	15.1338	15.9681	17.0461	20.4174
Leverage[a]	2725	0.2876	0.2051	0	0.1364	0.2565	0.4024	1.0178
Bribery	2725	0.1314	0.3379	0	0	0	0	1
Cross Listing	2725	0.8870	0.3167	0	1	1	1	1
Gov_Score	2725	22.2676	20.2403	0	2.1300	19.1600	35.4600	85.9600
ROA[a]	2725	0.0539	0.0798	-0.2334	0.0140	0.0415	0.0907	0.3613
Capex[a]	2725	0.0565	0.0706	0	0.0128	0.0367	0.0682	0.4164
TobinQ[a]	2725	1.6265	1.6147	0.1234	0.7224	1.1558	1.8752	10.4148
Portion[a]	2725	0.1807	0.2241	0.0019	0.0343	0.0857	0.2368	1
ESI	2725	0.1908	0.3930	0	0	0	0	1
Error FY1[a]	2682	0.0241	0.0623	0	0.0026	0.0071	0.0191	0.5
Error FY2[a]	2678	0.0344	0.0580	0.0002	0.0054	0.0143	0.0368	0.3755
Error FY3[a]	2385	0.0457	0.0682	0.0002	0.0087	0.0228	0.0538	0.4381
Analyst FY1[a]	2682	2.5071	0.6055	0.6931	2.1972	2.6391	2.9444	3.4965
Analyst FY2[a]	2678	2.3745	0.6373	0	2.0794	2.4849	2.8332	3.3673
Analyst FY3[a]	2385	1.0946	0.7459	0	0.6931	1.0986	1.6094	2.7081
Dispersion FY1[a]	2682	0.0081	0.0181	0.0002	0.0013	0.0028	0.0076	0.1369
Dispersion FY2[a]	2678	0.0107	0.0183	0	0.0024	0.0048	0.0112	0.1323
Dispersion FY3[a]	2385	0.0108	0.0180	0	0.0011	0.0048	0.0125	0.1170
Bias FY1[a]	2682	0.0044	0.0526	-0.1378	-0.0076	-0.0011	0.0062	0.3722
Bias FY2[a]	2678	0.0086	0.0598	-0.1919	-0.0105	0.0013	0.0196	0.3150
Bias FY3[a]	2385	0.0144	0.0724	-0.2470	-0.0105	0.0075	0.0354	0.3565
CED	2725	0.2547	0.4358	0	0	0	1	1
CSR	2725	0.1714	0.3769	0	0	0	0	1

[a] Variables winsorised at the 1st and 99th percentiles.

Panel B – dependent variables and firm control variables grouped by CED

	CED (NO)				CED (YES)				
Variable	**Obs.**	**Mean**	**St. Dev.**	**Median**	**Obs.**	**Mean**	**St. Dev.**	**Median**	**Wilcoxon T-test Mean**
CSR Index	2031	0.0222	0.1472	0	694	0.2911	0.4546	0	***
Var_Earning[a]	2031	-0.5691	1.2407	-0.6451	694	-0.4736	1.1705	-0.5506	**
Loss	2031	0.1472	0.3544	0	694	0.0865	0.2812	0	***
Size[a]	2031	15.8726	1.3421	15.6985	694	16.9145	1.3038	16.8911	***
Leverage[a]	2031	0.2910	0.2198	0.2526	694	0.2778	0.1536	0.2658	Ns
Bribery	2031	0.0876	0.2828	0	694	0.2594	0.4386	0	***
Cross Listing	2031	0.8744	0.3314	1	694	0.9236	0.2658	1	***
Gov_Score	2031	20.7221	19.8229	17.13	694	26.7908	20.7789	24.6750	***
ROA[a]	2031	0.0519	0.0837	0.0398	694	0.0599	0.0668	0.0465	***
Capex[a]	2031	0.0581	0.0779	0.0336	694	0.0517	0.0424	0.0434	***
TobinQ[a]	2031	1.7022	1.7628	1.1916	694	1.4048	1.0390	1.0747	Ns
Portion[a]	2031	0.1568	0.2088	0.0731	694	0.2505	0.2515	0.1569	***
ESI	2031	0.1536	0.3607	0	694	0.2997	0.4585	0	***
Error FY1[a]	1988	0.0262	0.0666	0.0076	694	0.0180	0.0471	0.0057	***
Error FY2[a]	1984	0.0365	0.0612	0.0159	694	0.0284	0.0471	0.0104	***
Error FY3[a]	1713	0.0498	0.0723	0.0249	672	0.0352	0.0549	0.0174	***
Analyst FY1[a]	1988	2.4414	0.6379	2.5649	694	2.6951	0.4515	2.7726	***
Analyst FY2[a]	1984	2.3099	0.6684	2.4849	694	2.5594	0.4943	2.6391	***
Analyst FY3[a]	1713	0.9665	0.7176	1.0986	672	1.4212	0.7169	1.3863	***
Dispersion FY1[a]	1988	0.0086	0.0193	0.0029	694	0.0069	0.0140	0.0027	Ns
Dispersion FY2[a]	1984	0.0111	0.0195	0.0049	694	0.0096	0.0144	0.0045	Ns
Dispersion FY3[a]	1713	0.0108	0.0187	0.0044	672	0.0110	0.0161	0.0058	***
Bias FY1[a]	1988	0.0056	0.0557	-0.0009	694	0.0010	0.0423	-0.0015	**
Bias FY2[a]	1984	0.0100	0.0625	0.0015	694	0.0043	0.0512	0.0007	Ns
Bias FY3[a]	1713	0.0165	0.0772	0.0081	672	0.0093	0.0579	0.0064	Ns
CED	2031	0	0	0	694	1	0	1	-
CSR	2031	0.0547	0.2274	0	694	0.5130	0.5002	1	***

[a] Variables winsorised at the 1st and 99th percentiles. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively, using a two-tailed test.

Panel C – dependent variables and firm control variables grouped by CSR

	CSR (NO)				CSR (YES)				
Variable	**Obs.**	**Mean**	**St. Dev.**	**Median**	**Obs.**	**Mean**	**St. Dev.**	**Median**	**Wilcoxon T-test Mean**
CSR Index	2258	0.0394	0.1946	0	467	0.3383	0.4736	0	***
Var_Earning[a]	2258	-0.5614	1.2351	-0.6348	467	-0.4643	1.1645	-0.5320	*
Loss	2258	0.1324	0.3390	0	467	0.1285	0.3350	0	Ns
Size[a]	2258	15.9789	1.3605	15.8441	467	16.9069	1.3784	16.8408	***
Leverage[a]	2258	0.2893	0.2139	0.2535	467	0.2794	0.1557	0.2718	Ns
Bribery	2258	0.1045	0.3060	0	467	0.2612	0.4398	0	***
Cross Listing	2258	0.8826	0.3219	1	467	0.9079	0.2894	1	Ns
Gov_Score	2258	20.8177	19.9510	17.2600	467	29.2783	20.1849	27.6000	***
ROA[a]	2258	0.0545	0.0826	0.0415	467	0.0510	0.0648	0.0414	Ns
Capex[a]	2258	0.0569	0.0738	0.0350	467	0.0543	0.0524	0.0458	***
TobinQ[a]	2258	1.7129	1.7154	1.2162	467	1.2088	0.8819	0.9485	***
Portion[a]	2258	0.1683	0.2168	0.0789	467	0.2406	0.2482	0.1533	***
ESI	2258	0.1785	0.3830	0	467	0.2505	0.4338	0	***
Error FY1[a]	2215	0.0243	0.0639	0.0070	467	0.0229	0.0536	0.0077	Ns
Error FY2[a]	2211	0.0346	0.0598	0.0143	467	0.0334	0.0481	0.0146	Ns
Error FY3[a]	1928	0.0468	0.0693	0.0235	457	0.0413	0.0628	0.0188	**
Analyst FY1[a]	2215	2.4761	0.6302	2.6391	467	2.6540	0.4429	2.7726	***
Analyst FY2[a]	2211	2.3420	0.6613	2.4849	467	2.5286	0.4798	2.6391	***
Analyst FY3[a]	1928	1.0055	0.7421	1.0986	457	1.4704	0.6376	1.6094	***
Dispersion FY1[a]	2215	0.0079	0.0184	0.0028	467	0.0090	0.0167	0.0035	***
Dispersion FY2[a]	2211	0.0104	0.0185	0.0046	467	0.0122	0.0173	0.0057	***
Dispersion FY3[a]	1928	0.0101	0.0176	0.0042	457	0.0140	0.0196	0.0072	***
Bias FY1[a]	2215	0.0044	0.0531	-0.0011	467	0.0044	0.0501	-0.0013	Ns
Bias FY2[a]	2211	0.0092	0.0605	0.0012	467	0.0054	0.0561	0.0019	Ns
Bias FY3[a]	1928	0.0153	0.0735	0.0073	457	0.0107	0.0671	0.0079	Ns
CED	2258	0.1497	0.3568	0	467	0.7623	0.4261	1	***
CSR	2258	0	0	0	467	1	0	1	-

[a] Variables winsorised at the 1st and 99th percentiles. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively, using a two-tailed test.

Table 4: Correlation analysis

	#	1	2	3	4	5	6	7	8	9	10	11	12	13
CSR Index	1	1												
Var_Earning[a]	2	0.0162	1											
Loss	3	-0.0436	0.2341*	1										
Size[a]	4	0.2156*	0.1961*	-0.0095	1									
Leverage[a]	5	-0.0173	-0.1189*	0.0865*	-0.049	1								
Bribery	6	0.1951*	0.0921*	-0.0102	0.3308*	-0.1152*	1							
Cross Listing	7	0.0885*	-0.0553*	-0.1180*	0.1999*	-0.017	0.0977*	1						
Gov_Score	8	0.0979*	0.0698*	0.0192	0.2012*	-0.0463	0.0732*	0.0203	1					
ROA[a]	9	0.0437	-0.1517*	-0.5534*	-0.2606*	-0.1887*	0.0123	0.0970*	-0.0387	1				
Capex[a]	10	-0.0331	-0.0820*	-0.0234	-0.2389*	0.2288*	-0.1026*	0.0075	-0.0018	0.1663*	1			
TobinQ[a]	11	-0.0375	-0.2080*	-0.1207*	-0.4740*	0.0017	-0.0479	0.0502*	-0.0920*	0.5430*	0.2199*	1		
Portion[a]	12	0.2460*	0.0306	-0.0405	0.2299*	0.0372	0.1676*	0.1327*	-0.2337*	0.0303	-0.0655*	0.007	1	
ESI	13	0.0321	0.0655*	0.029	-0.0966*	-0.0276	0.0268	-0.0538*	-0.0052	0.1325*	0.3574*	0.1205*	-0.0962*	1
Error FY1[a]	14	-0.0268	0.2033*	0.3160*	0.0996*	0.0581*	-0.018	-0.0600*	0.0027	-0.2398*	-0.0443	-0.1705*	0.0231	-0.0349
Error FY2[a]	15	-0.0405	0.2130*	0.2663*	0.0730*	0.0393	-0.0245	-0.0520*	-0.0256	-0.2094*	-0.0035	-0.1866*	0.013	0.0384
Error FY3[a]	16	-0.0658*	0.2189*	0.2500*	0.0406	0.0833*	-0.0570*	-0.0836*	0	-0.1769*	0.0413	-0.1578*	-0.0189	0.0581*
Analyst FY1[a]	17	0.1327*	0.0546*	-0.0734*	0.3025*	-0.2662*	0.2132*	0.2006*	0.1404*	0.1543*	-0.0028	0.1342*	0.0678*	0.1773*
Analyst FY2[a]	18	0.1298*	0.0510*	-0.0785*	0.3004*	-0.2664*	0.2159*	0.1899*	0.1436*	0.1542*	-0.0281	0.1382*	0.0594*	0.1520*
Analyst FY3[a]	19	0.1738*	0.1188*	0.0306	0.2708*	-0.0860*	0.2126*	0.0950*	0.0429	0.0493	0.0571*	0.1023*	0.0568*	0.2251*
Dispersion FY1[a]	20	-0.0204	0.2415*	0.4152*	0.0811*	0.0517*	-0.0106	-0.0765*	0.0378	-0.2691*	0.0361	-0.1900*	-0.0029	0.0424
Dispersion FY2[a]	21	-0.0341	0.2536*	0.4219*	0.0396	0.0588*	-0.0277	-0.0967*	0.0157	-0.2677*	0.0951*	-0.1880*	-0.0212	0.1103*
Dispersion FY3[a]	22	-0.0138	0.1841*	0.3043*	0.0476	0.0473	-0.0015	-0.0335	0.0109	-0.1902*	0.1356*	-0.1334*	-0.0369	0.1639*
Bias FY1[a]	23	0.0011	0.0606*	0.0974*	0.1177*	0.0421	-0.0072	0.0108	-0.033	-0.0787*	-0.0783*	-0.0667*	0.0528*	-0.0792*
Bias FY2[a]	24	-0.0283	0.1122*	0.0406	0.1328*	0.0308	-0.0107	0.0313	-0.0305	-0.0596*	-0.0739*	-0.0656*	0.0139	-0.0951*
Bias FY3[a]	25	-0.0261	0.0999*	0.0780*	0.1476*	0.0456	-0.0108	0.0398	-0.0023	-0.1008*	-0.0721*	-0.0699*	-0.0122	-0.0940*
CED	26	0.4081*	0.034	-0.0783*	0.3226*	-0.0281	0.2215*	0.0677*	0.1307*	0.0439	-0.0392	-0.0803*	0.1822*	0.1620*
CSR	27	0.3923*	0.0299	-0.0044	0.2485*	-0.0181	0.1748*	0.0301	0.1575*	-0.0165	-0.0142	-0.1176*	0.1216*	0.0691*

Continues…

	#	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Error FY1[a]	14	1													
Error FY2[a]	15	0.6657*	1												
Error FY3[a]	16	0.5711*	0.6999*	1											
Analyst FY1[a]	17	-0.1017*	-0.0613*	-0.0620*	1										
Analyst FY2[a]	18	-0.0949*	-0.0578*	-0.0626*	0.9650*	1									
Analyst FY3[a]	19	-0.0537*	-0.0208	-0.0496	0.5408*	0.5665*	1								
Dispersion FY1[a]	20	0.7325*	0.5851*	0.5740*	-0.0822*	-0.0834*	-0.0244	1							
Dispersion FY2[a]	21	0.6681*	0.5807*	0.5963*	-0.0593*	-0.0545*	0.0153	0.9204*	1						
Dispersion FY3[a]	22	0.3926*	0.4047*	0.4380*	0.0938*	0.1013*	0.2774*	0.5751*	0.6784*	1					
Bias FY1[a]	23	0.5832*	0.3517*	0.2347*	-0.0109	-0.0184	-0.013	0.3281*	0.2741*	0.2216*	1				
Bias FY2[a]	24	0.3043*	0.3745*	0.1946*	-0.0156	-0.0109	0.0055	0.1940*	0.1389*	0.0992*	0.5674*	1			
Bias FY3[a]	25	0.2510*	0.1689*	0.2728*	0.0149	0.0276	0.0003	0.1901*	0.1489*	0.1297*	0.4289*	0.6685*	1		
CED	26	-0.0576*	-0.0612*	-0.0965*	0.1836*	0.1716*	0.2743*	-0.0403	-0.0365	0.0061	-0.0381	-0.042	-0.0448	1	
CSR	27	-0.0087	-0.0077	-0.0317	0.1114*	0.1111*	0.2453*	0.0229	0.0365	0.0850*	-0.0005	-0.0242	-0.0249	0.5299*	1

[a] Variables winsorised at the 1st and 99th percentiles. * Denotes significance at the 1%, using a two-tailed test.

Table 5: Logit Model for PSM – Determinants of CED disclosure and CSR reporting

Panel A: Forecast horizon 1 year ahead

	CED			**CSR**		
	Coef.	z	P>z	Coef.	z	P>z
Analyst FY1[a]	0.1430	1.26	0.207	0.2268	1.7*	0.089
Bribery	0.3690	2.36**	0.018	0.2415	1.3	0.193
Cross Listing	0.0862	0.45	0.656	0.0333	0.16	0.872
Gov_Score	0.0112	3.79***	0	0.0196	5.51***	0
ROA[a]	2.2401	1.84*	0.066	2.6309	1.7*	0.089
CSR Index	2.2651	11.52***	0	2.0632	10.51***	0
ESI	1.5557	10.34***	0	0.9284	5.19***	0
Var_Earning[a]	-0.0993	-2.03**	0.042	-0.1470	-2.59***	0.01
Loss	-0.6849	-3.03**	0.002	-0.2713	-1.13	0.258
Size[a]	0.5177	9.38***	0	0.3879	5.92***	0
Portion[a]	1.3165	4.98***	0	1.4597	4.58***	0
Leverage[a]	0.6868	2.27**	0.023	0.4946	1.35	0.179
TobinQ[a]	-0.0368	-0.64	0.522	-0.2647	-2.86***	0.004
Capex[a]	-2.4544	-2.61***	0.009	-0.0184	-0.02	0.986
Year Control	*Yes*			*Yes*		
Constant	-12.3642	-13.5***	0	-12.2038	-10.64***	0
N	2,682			2,682		
Treated-Support	503			300		
Pseudo R²	0,2841			0,3523		

ATT	**Treated**	**Controls**	**T-stat**	**Treated**	**Controls**	**T-stat**
Error FY1	1.6395	2.7298	-2.20**	2.2540	3.0670	-1.34
Bias FY1	-0.1617	0.8443	-2.41**	0.2566	1.0394	-1.49
Dispersion FY1	0.6428	0.8570	-1.72*	0.9075	1.0318	-0.71

[a] Variables winsorised at the 1st and 99th percentiles. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively, using a two-tailed test. See Appendices A and B for variable definitions. Dependent variables have been multiplied by 100.

Panel B: Forecast horizon 2 year ahead

	CED			**CSR**		
	Coef.	z	P>z	Coef.	z	P>z
Analyst FY2[a]	0.0362	0.34	0.733	0.1760	1.4	0.163
Bribery	0.3749	2.39**	0.017	0.2421	1.31	0.192
Cross Listing	0.0969	0.5	0.616	0.0338	0.16	0.87
Gov_Score	0.0113	3.84***	0	0.0196	5.51***	0
ROA[a]	2.2817	1.88*	0.06	2.6338	1.7*	0.089
CSR Index	2.2748	11.55***	0	2.0662	10.52***	0
ESI	1.5762	10.51***	0	0.9422	5.3***	0
Var_Earning[a]	-0.1000	-2.05**	0.04	-0.1468	-2.59***	0.01
Loss	-0.6833	-3.03***	0.002	-0.2746	-1.15	0.252
Size[a]	0.5368	9.72***	0	0.3956	6.04***	0
Portion[a]	1.3048	4.94***	0	1.4542	4.56***	0
Leverage[a]	0.6211	2.05**	0.04	0.4659	1.27	0.205
TobinQ[a]	-0.0260	-0.45	0.65	-0.2598	-2.82***	0.005
Capex[a]	-2.3524	-2.53**	0.012	0.0414	0.04	0.967
Year Control	*Yes*			*Yes*		
Constant	-12.4103	-13.5***	0	-12.1641	-10.59***	0
N	2,678			2,678		
Treated-Support	497			305		
Pseudo R²	0,2837			0,3521		

ATT	**Treated**	**Controls**	**T-stat**	**Treated**	**Controls**	**T-stat**
Error FY2	2.8520	3.9295	-2.43**	3.5147	4.2247	-1.23
Bias FY2	0.2211	1.5568	-2.84***	0.2904	1.4572	-2**
Dispersion FY2	0.9465	1.1494	-1.62	1.2694	1.3320	-0.32

[a] Variables winsorised at the 1st and 99th percentiles. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively, using a two-tailed test. See Appendices A and B for variable definitions. Dependent variables have been multiplied by 100.

Panel C: Forecast horizon 3 year ahead

	CED			**CSR**		
	Coef.	z	P>z	Coef.	z	P>z
Analyst FY3[a]	0.2993	3.25***	0.001	0.3879	3.46***	0.001
Bribery	0.3464	2.17**	0.03	0.2287	1.22	0.224
Cross Listing	0.0724	0.36	0.719	-0.0145	-0.07	0.946
Gov_Score	0.0115	3.77***	0	0.0206	5.63***	0
ROA[a]	2.1586	1.76*	0.078	2.2744	1.45	0.148
CSR Index	2.1732	10.83***	0	2.0051	10.06***	0
ESI	1.5284	9.78***	0	0.8661	4.76***	0
Var_Earning[a]	-0.0886	-1.74*	0.082	-0.1311	-2.23**	0.026
Loss	-0.6795	-2.93***	0.003	-0.3412	-1.38	0.168
Size[a]	0.4539	7.96***	0	0.3090	4.51***	0
Portion[a]	1.3424	4.86***	0	1.5441	4.68***	0
Leverage[a]	0.7952	2.59***	0.009	0.5505	1.49	0.137
TobinQ[a]	-0.0791	-1.33	0.184	-0.3245	-3.36***	0.001
Capex[a]	-3.2716	-3.3***	0.001	-0.5943	-0.56	0.575
Year Control	*Yes*			*Yes*		
Constant	-11.0895	-11.09***	0	-10.3126	-8.36***	0
N	2,385			2,385		
Treated-Support	490			294		
Pseudo R²	0,2786			0,3469		

ATT	**Treated**	**Controls**	**T-stat**	**Treated**	**Controls**	**T-stat**
Error FY3	3.7923	5.2659	-2.89***	4.4106	4.9260	-0.77
Bias FY3	0.8377	2.2551	-2.5**	1.1105	1.9902	-1.25
Dispersion FY3	1.1050	1.3341	-1.64	1.4533	1.3883	0.32

[a] Variables winsorised at the 1st and 99th percentiles. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively, using a two-tailed test. See Appendices A and B for variable definitions. Dependent variables have been multiplied by 100.

Table 6: Differences in Variable Means after Propensity-Score-Matching (main variables)

Panel A: Forecast horizon 1 year ahead

	CED Mean				CSR Mean			
Variable	**Treated**	**Control**	***t***	***p>t***	**Treated**	**Control**	***t***	***p>t***
Analyst FY1[a]	2.6251	2.5809	1.24	0.213	2.5734	2.6178	-1.02	0.307
Bribery	0.1809	0.1730	0.33	0.741	0.1567	0.1600	-0.11	0.911
Cross Listing	0.9086	0.9046	0.22	0.829	0.8733	0.8700	0.12	0.903
Gov_Score	25.7710	24.5710	0.93	0.354	27.6650	28.0390	-0.23	0.82
ROA[a]	0.0545	0.0556	-0.25	0.803	0.0449	0.0529	-1.39	0.166
CSR Index	0.1332	0.1471	-0.64	0.525	0.0700	0.1567	-3.37***	0.001
ESI	0.2505	0.2406	0.37	0.714	0.2333	0.2833	-1.4	0.162
Year 2004	0.0636	0.0537	0.67	0.503	0.0233	0.0333	-0.74	0.461
Year 2005	0.0994	0.0994	0	1	0.0300	0.0233	0.51	0.613
Year 2006	0.1431	0.1928	-2.11**	0.035	0.0567	0.1033	-2.11**	0.035
Year 2007	0.1650	0.1630	0.09	0.932	0.2333	0.2267	0.19	0.846
Year 2008	0.2008	0.2088	-0.31	0.755	0.3067	0.2700	0.99	0.322
Year 2009	0.2783	0.2485	1.07	0.283	0.3300	0.3067	0.61	0.54
Var_Earning[a]	-0.5282	-0.5289	0.01	0.992	-0.5080	-0.5277	0.2	0.841
Loss	0.0954	0.0875	0.44	0.662	0.1467	0.1400	0.23	0.816
Size[a]	16.6270	16.5970	0.35	0.723	16.5500	16.4710	0.73	0.466
Portion[a]	0.2113	0.2166	-0.34	0.733	0.1907	0.1914	-0.04	0.97
Leverage[a]	0.2797	0.2920	-1.06	0.288	0.2850	0.2890	-0.26	0.795
TobinQ[a]	1.3884	1.4161	-0.35	0.725	1.1900	1.3765	-2.09**	0.037
Capex[a]	0.0523	0.0553	-0.8	0.423	0.0560	0.0568	-0.16	0.875

[a] Variables winsorised at the 1st and 99th percentiles.

Panel B: Forecast horizon 2 year ahead

	CED Mean				CSR Mean			
Variable	**Treated**	**Control**	***t***	***p>t***	**Treated**	**Control**	***t***	***p>t***
Analyst FY2[a]	2.4906	2.4637	0.7	0.482	2.4428	2.3820	1.3	0.195
Bribery	0.1811	0.1751	0.25	0.804	0.1508	0.1312	0.7	0.486
Cross Listing	0.9135	0.8893	1.28	0.202	0.8787	0.8721	0.24	0.807
Gov_Score	25.6130	25.2750	0.26	0.795	27.6930	27.2810	0.25	0.805
ROA[a]	0.0557	0.0509	1.17	0.241	0.0461	0.0473	-0.24	0.809
CSR Index	0.1167	0.1006	0.81	0.415	0.1016	0.1443	-1.6	0.109
ESI	0.2415	0.2113	1.14	0.256	0.2197	0.2689	-1.41	0.158
Year 2004	0.0624	0.0342	2.07**	0.038	0.0230	0.0262	-0.26	0.794
Year 2005	0.1026	0.0986	0.21	0.833	0.0295	0.0230	0.51	0.613
Year 2006	0.1529	0.1509	0.09	0.93	0.0557	0.0590	-0.17	0.862
Year 2007	0.1630	0.1670	-0.17	0.864	0.2230	0.2361	-0.38	0.701
Year 2008	0.1992	0.1811	0.73	0.467	0.3115	0.2689	1.16	0.247
Year 2009	0.2656	0.3300	-2.22**	0.026	0.3377	0.3344	0.09	0.932
Var_Earning[a]	-0.5139	-0.4523	-0.79	0.428	-0.5154	-0.6348	1.2	0.23
Loss	0.0946	0.1087	-0.73	0.463	0.1443	0.1541	-0.34	0.734
Size[a]	16.6420	16.6100	0.37	0.715	16.5470	16.4620	0.81	0.419
Portion[a]	0.2154	0.2325	-1.06	0.291	0.1878	0.1995	-0.65	0.518
Leverage[a]	0.2819	0.2822	-0.03	0.978	0.2822	0.2816	0.04	0.965
TobinQ[a]	1.4041	1.2976	1.41	0.158	1.1952	1.2427	-0.58	0.562
Capex[a]	0.0530	0.0518	0.32	0.747	0.0550	0.0546	0.08	0.938

[a] Variables winsorised at the 1st and 99th percentiles.

Panel C: Forecast horizon 3 year ahead

	CED Mean				CSR Mean			
Variable	**Treated**	**Control**	***t***	***p>t***	**Treated**	**Control**	***t***	***p>t***
Analyst FY3[a]	1.2923	1.2439	1.1	0.271	1.3231	1.3663	-0.78	0.437
Bribery	0.1980	0.2122	-0.55	0.58	0.1531	0.1871	-1.1	0.273
Cross Listing	0.9102	0.9327	-1.31	0.192	0.8844	0.8674	0.62	0.533
Gov_Score	25.2980	25.5470	-0.19	0.846	27.2900	28.5400	-0.73	0.466
ROA[a]	0.0562	0.0521	0.88	0.379	0.0455	0.0511	-1.01	0.312
CSR Index	0.1286	0.1347	-0.28	0.777	0.1054	0.1122	-0.26	0.792
ESI	0.2694	0.2225	1.71*	0.088	0.2313	0.2313	0	1
Year 2004	0.0551	0.0469	0.58	0.562	0.0204	0.0238	-0.28	0.78
Year 2005	0.1020	0.0959	0.32	0.749	0.0306	0.0340	-0.23	0.816
Year 2006	0.1612	0.1796	-0.76	0.445	0.0578	0.0714	-0.67	0.503
Year 2007	0.1674	0.2082	-1.64	0.102	0.2449	0.2415	0.1	0.924
Year 2008	0.2020	0.2041	-0.08	0.937	0.2721	0.2857	-0.37	0.714
Year 2009	0.2674	0.2245	1.56	0.12	0.3537	0.3061	1.23	0.22
Var_Earning[a]	-0.4732	-0.4975	0.31	0.755	-0.4932	-0.5176	0.25	0.8
Loss	0.1020	0.1122	-0.52	0.606	0.1531	0.1191	1.2	0.23
Size[a]	16.6900	16.7940	-1.13	0.258	16.6030	16.6990	-0.84	0.403
Portion[a]	0.2127	0.2348	-1.41	0.158	0.1928	0.1966	-0.2	0.841
Leverage[a]	0.2801	0.2717	0.75	0.452	0.2879	0.2764	0.77	0.441
TobinQ[a]	1.3842	1.3098	0.91	0.363	1.1955	1.2444	-0.6	0.549
Capex[a]	0.0528	0.0511	0.44	0.657	0.0555	0.0491	1.24	0.216

[a] Variables winsorised at the 1st and 99th percentiles.

Table 7: Regression result on the matched sample

Panel A: Forecast horizon 1 year ahead

	(1) ErrorFY1	(2) BiasFY1	(3) DispFY1	(4) ErrorFY1	(5) BiasFY1	(6) DispFY1
CED	**-1.0995*****	**-0.9617*****	**-0.2182****			
	(-2.87)	**(-2.95)**	**(-2.19)**			
CSR				**-1.1394****	**-0.9704***	**-0.2121**
				(-2.03)	**(-1.87)**	**(-1.20)**
Bribery	-0.5797	-0.0587	-0.2880***	0.0894	-0.3555	-0.1501
	(-1.20)	(-0.14)	(-2.62)	(0.12)	(-0.47)	(-0.69)
Cross Listing	-0.8647	-0.7379	-0.4950**	-0.7518	-1.1758	-0.1689
	(-1.09)	(-1.11)	(-2.06)	(-0.76)	(-1.17)	(-0.61)
Gov_Score	-0.0017	-0.0061	-0.0001	-0.0063	-0.0076	-0.0030
	(-0.17)	(-0.70)	(-0.03)	(-0.49)	(-0.71)	(-0.89)
Roa	3.0880	4.6202	2.4668*	8.5668	14.5465*	5.5861**
	(0.58)	(0.87)	(1.66)	(1.15)	(1.81)	(2.27)
CSRIndex	-1.2816**	-0.7715*	-0.3053**	-1.3475**	-0.7012	-0.1259
	(-2.59)	(-1.95)	(-2.49)	(-1.98)	(-0.96)	(-0.58)
ESI	-0.1619	-0.7494*	0.0680	-0.2536	-0.6946	-0.0938
	(-0.35)	(-1.83)	(0.50)	(-0.55)	(-1.48)	(-0.53)
Var_EAR	0.6138***	0.0545	0.1661***	0.0784	-0.7656**	-0.0068
	(3.01)	(0.27)	(3.16)	(0.24)	(-2.25)	(-0.06)
Loss	4.9571***	2.1897*	1.6747***	5.1147**	3.4195*	2.6344***
	(2.83)	(1.68)	(3.57)	(2.46)	(1.68)	(4.25)
Analyst FY1	-0.4823	0.1492	0.1052	-0.9267	-0.1527	-0.1730
	(-1.16)	(0.46)	(1.10)	(-1.26)	(-0.22)	(-0.66)
Size	0.2242	0.2505	0.0985*	0.7657**	0.7599**	0.2214*
	(1.16)	(1.43)	(1.88)	(2.25)	(2.38)	(1.85)
Portion	-0.3326	-0.2018	0.0348	-0.4988	0.2103	-0.2706
	(-0.38)	(-0.25)	(0.15)	(-0.40)	(0.17)	(-0.72)
LEV	-0.5970	0.6555	0.3906	4.3765*	2.3173	0.9009
	(-0.78)	(0.84)	(1.49)	(1.82)	(1.02)	(1.53)
TobinQ	-0.3234	-0.1251	-0.1717***	-0.5034**	-0.4484**	-0.2202***
	(-1.46)	(-0.57)	(-2.73)	(-2.06)	(-2.00)	(-2.82)
CAPEX	-5.6881**	-5.2462*	1.6309*	-9.5979**	-9.7430**	-0.4496
	(-2.05)	(-1.87)	(1.88)	(-2.20)	(-2.53)	(-0.36)
Year Control	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Constant	1.4103	-3.5787	-1.0800	-7.2661	-12.4366**	-2.7168
	(0.49)	(-1.28)	(-1.32)	(-1.42)	(-2.52)	(-1.50)
Observations	1006	1006	1006	600	600	600
Adjusted R^2	0.167	0.060	0.308	0.147	0.106	0.274
F	3.3811	2.4940	7.5233	3.1740	1.8292	5.3567

Table presents OLS regression results using matched sample (i.e. fweight = _weight) obtained through PSMatch procedure. Dependent and Independent variables are as described in Appendix A and B. *T* statistics in parentheses, Standard Error are clustered by firm. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively, using a two-tailed test. [a]Continuous variables winsorised at the 1st and 99th percentiles. Dependent variables have been multiplied by 100.

Panel B: Forecast horizon 2 year ahead

	(1) ErrorFY2	(2) BiasFY2	(3) DispFY2	(4) ErrorFY2	(5) BiasFY2	(6) DispFY2
CED	**-0.9912****	**-1.1887*****	**-0.1792**			
	(-2.40)	**(-2.86)**	**(-1.51)**			
CSR				**-0.8179**	**-1.3853****	**-0.1516**
				(-1.39)	**(-2.36)**	**(-0.89)**
Bribery	-0.4794	-0.5654	-0.0818	-0.0919	0.0905	-0.0774
	(-1.07)	(-1.08)	(-0.60)	(-0.14)	(0.13)	(-0.38)
Cross Listing	-1.2696	-0.9043	-0.1504	-0.5467	0.6299	-0.0402
	(-1.53)	(-0.99)	(-0.63)	(-0.68)	(0.60)	(-0.14)
Gov_Score	-0.0020	-0.0076	0.0007	-0.0104	0.0005	-0.0029
	(-0.23)	(-0.74)	(0.26)	(-0.94)	(0.04)	(-0.83)
Roa	6.8095	5.6301	-0.3913	5.8954	7.5949	0.2924
	(1.40)	(1.05)	(-0.22)	(0.61)	(0.78)	(0.10)
CSRIndex	-0.7858*	-0.6209	-0.2941*	-0.5090	-2.0044**	-0.2464
	(-1.75)	(-1.21)	(-1.72)	(-0.50)	(-2.48)	(-0.89)
ESI	0.4760	-1.7824***	0.3483**	0.7603	-0.4542	0.1784
	(0.90)	(-3.05)	(2.26)	(0.99)	(-0.53)	(0.78)
Var_EAR	0.5983**	0.1800	0.1754***	0.8806***	0.4138	0.2509***
	(2.27)	(0.67)	(2.64)	(2.75)	(1.25)	(2.93)
Loss	2.2948**	1.7192*	1.4966***	3.3513**	1.3934	1.7449***
	(2.16)	(1.73)	(3.71)	(2.24)	(1.00)	(3.83)
Analyst FY2	0.1094	-0.7080	0.1528	0.0801	-0.4320	0.0110
	(0.21)	(-1.52)	(1.13)	(0.12)	(-0.65)	(0.04)
Size	0.0137	0.7749***	0.0240	0.0122	0.3919	0.0289
	(0.06)	(3.30)	(0.39)	(0.04)	(1.40)	(0.24)
Portion	-0.8002	-2.2860**	0.0429	-0.0713	-2.4823*	-0.0596
	(-0.91)	(-2.30)	(0.17)	(-0.06)	(-1.84)	(-0.17)
LEV	0.9116	0.7347	0.4410	5.7874**	1.7150	1.1776*
	(0.67)	(0.55)	(1.15)	(2.23)	(0.76)	(1.86)
TobinQ	-0.9393***	-0.0085	-0.1238*	-1.0917***	-0.3768	-0.1854
	(-4.36)	(-0.04)	(-1.83)	(-2.75)	(-0.98)	(-1.59)
CAPEX	-3.8688	-0.9359	2.1102**	-2.5894	-10.9205**	2.5918
	(-1.38)	(-0.29)	(2.49)	(-0.53)	(-2.21)	(1.36)
Year Control	Yes	Yes	Yes	Yes	Yes	Yes
Constant	6.6282*	-11.0685***	-0.2110	4.0433	-8.0570*	-0.1067
	(1.75)	(-2.86)	(-0.22)	(0.74)	(-1.70)	(-0.06)
Observations	994	994	994	610	610	610
Adjusted R^2	0.109	0.140	0.286	0.151	0.157	0.292
F	4.2856	4.6617	8.7937	3.8227	4.3374	5.9927

Table presents OLS regression results using matched sample (i.e. fweight = _weight) obtained through PSMatch procedure. Dependent and Independent variables are as described in Appendix A and B. *T* statistics in parentheses, Standard Error are clustered by firm. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively, using a two-tailed test. [a]Continuous variables winsorised at the 1st and 99th percentiles. Dependent variables have been multiplied by 100.

Panel C: Forecast horizon 3 year ahead

	(1) ErrorFY3	(2) BiasFY3	(3) DispFY3	(4) ErrorFY3	(5) BiasFY3	(6) DispFY3
CED	**-1.4840*** **	**-1.0493** **	**-0.2630** **			
	(-3.25)	**(-2.12)**	**(-2.08)**			
CSR				**-0.5997**	**-0.9473**	**-0.0120**
				(-1.10)	**(-1.42)**	**(-0.06)**
Bribery	-0.4076	0.5046	-0.1634	-0.0874	0.8411	0.0198
	(-0.64)	(0.79)	(-1.04)	(-0.13)	(1.10)	(0.08)
Cross Listing	-1.8011*	0.2635	0.0262	0.2896	-0.3986	0.3195
	(-1.76)	(0.20)	(0.10)	(0.30)	(-0.29)	(0.71)
Gov_Score	0.0034	0.0155	0.0006	-0.0013	-0.0024	0.0010
	(0.26)	(1.13)	(0.19)	(-0.10)	(-0.14)	(0.26)
Roa	4.8380	-8.3666	0.0024	-5.5934	-10.3127	3.2117
	(0.72)	(-0.97)	(0.00)	(-0.64)	(-0.93)	(1.04)
CSRIndex	-0.8376	-0.5187	-0.2994	-0.5711	0.1518	-0.4199**
	(-1.21)	(-0.65)	(-1.65)	(-0.77)	(0.15)	(-2.16)
ESI	2.6344***	-0.5060	0.6083***	1.0031	-0.1450	0.5938*
	(3.59)	(-0.58)	(3.10)	(1.07)	(-0.12)	(1.70)
Var_EAR	0.9048***	0.8652***	0.2210***	1.1809***	0.5399	0.1454
	(4.34)	(2.98)	(3.59)	(3.43)	(1.23)	(1.36)
Loss	2.5284**	0.0902	0.9232**	2.9377**	1.6297	1.7360***
	(2.08)	(0.07)	(2.44)	(2.13)	(1.01)	(3.54)
AnalystFY3	-0.4041	-1.0089**	0.4296***	-0.0351	-1.0345*	0.7626***
	(-1.10)	(-2.41)	(4.17)	(-0.07)	(-1.74)	(4.53)
Size	0.3102	1.2914***	0.0142	-0.4682	0.6490	-0.2310*
	(0.98)	(4.11)	(0.18)	(-1.32)	(1.48)	(-1.69)
Portion	0.5023	-0.8555	-0.0012	-0.3913	-3.4547*	-0.0394
	(0.53)	(-0.73)	(-0.00)	(-0.31)	(-1.90)	(-0.09)
LEV	1.7552	1.0469	0.5651	3.6962*	-0.1913	1.4852*
	(1.28)	(0.60)	(1.59)	(1.80)	(-0.07)	(1.81)
TobinQ	-0.6780**	0.8302**	-0.2014**	-1.0145**	0.7517	-0.6468***
	(-2.16)	(2.06)	(-2.33)	(-2.24)	(1.34)	(-3.84)
CAPEX	-3.3690	1.7636	3.7144***	2.0532	-2.0610	2.2677
	(-0.84)	(0.38)	(3.50)	(0.32)	(-0.31)	(1.04)
Year Control	Yes	Yes	Yes	Yes	Yes	Yes
Constant	4.8487	-27.1184***	-0.0636	16.0910**	-12.8631	3.1817
	(0.76)	(-4.55)	(-0.05)	(2.45)	(-1.65)	(1.35)
Observations	980	980	980	588	588	588
Adjusted R^2	0.172	0.178	0.287	0.193	0.107	0.255
F	5.2890	5.5475	12.0670	4.1854	4.6045	6.1282

Table presents OLS regression results using matched sample (i.e. fweight = _weight) obtained through PSMatch procedure. Dependent and Independent variables are as described in Appendix A and B. *T* statistics in parentheses, Standard Error are clustered by firm. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively, using a two-tailed test. [a]Continuous variables winsorised at the 1st and 99th percentiles. Dependent variables have been multiplied by 100.

Table 8: CED-CSR and Analysts' Information Environment

Panel A: Logit Model for PSM – Determinants of CED disclosure and CSR reporting

	CED			**CSR**		
	Coef.	z	P>z	Coef.	z	P>z
Bribery	0.2629	1.57	0.117	0.2199	1.13	0.257
Cross Listing	0.0802	0.36	0.722	0.0714	0.3	0.766
Gov_Score	0.0108	3.25***	0.001	0.0217	5.55***	0
ROA[a]	3.0371	2.25**	0.024	2.4903	1.47	0.142
CSR Index	2.1769	10.32***	0	2.0572	9.79***	0
ESI	1.6412	9.91***	0	0.9890	5.21***	0
Var_Earning[a]	-0.0429	-0.76	0.445	-0.0889	-1.4	0.162
Loss	-0.7117	-2.84***	0.004	-0.4389	-1.65*	0.099
Size[a]	0.5174	8.84***	0	0.3949	5.8***	0
Portion[a]	1.4493	4.76***	0	1.5381	4.38***	0
Leverage[a]	0.9536	2.84***	0.004	0.7274	1.85*	0.064
TobinQ[a]	-0.0651	-1.04	0.297	-0.2944	-2.96***	0.003
Capex[a]	-3.5688	-3.3***	0.001	-0.7035	-0.61	0.544
Year Control	*Yes*			*Yes*		
Constant	-11.9856	-11.18***	0	-11.5766	-8.96***	0
N	1,888			1,888		
Treated-Support	425			269		
Pseudo R²	0,2747			0,3458		

ATT	**Treated**	**Controls**	**T-stat**	**Treated**	**Controls**	**T-stat**
Uncertainty All FY1	5.1976	6.0965	-3.71***	5.4535	5.4907	-0.13
Uncertainty All FY2	5.0024	6.1459	-4.74***	5.5130	5.6357	-0.43
Uncertainty All FY3	5.1129	6.1671	-4.56***	5.6059	5.6394	-0.12
Uncertainty Com. FY1	5.2894	6.1129	-3.59***	5.5539	5.1896	1.33
Uncertainty Com. FY2	5.0918	5.9906	-3.83***	5.4870	5.4275	0.21
Uncertainty Com. FY3	4.1624	4.8094	-3.23***	4.6580	4.5911	0.29

[a] Variables winsorised at the 1st and 99th percentiles. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively, using a two-tailed test. See Paragraph 4.4. and Appendices A and B for variable definitions. Dependent variables is expressed in decile rank by year.

Panel B: Differences in Variable Means after Propensity-Score-Matching (main variables)

	CED Mean				**CSR Mean**			
Variable	**Treated**	**Control**	***t***	***p>t***	**Treated**	**Control**	***t***	***p>t***
Bribery	0.1977	0.2400	-1.49	0.136	0.1599	0.1227	1.24	0.217
Cross Listing	0.9200	0.9200	0	1	0.8996	0.8885	0.42	0.675
Gov_Score	25.2330	24.2620	0.71	0.477	27.6640	29.6780	-1.15	0.249
ROA[a]	0.0577	0.0559	0.41	0.683	0.0472	0.0596	-2.04	0.042
CSR Index	0.1271	0.1412	-0.6	0.546	0.1004	0.1115	-0.42	0.675
ESI	0.2871	0.2306	1.88	0.06	0.2491	0.2714	-0.59	0.556
Year 2004	0.0494	0.0706	-1.3	0.194	0.0223	0.0186	0.3	0.761
Year 2005	0.0824	0.0941	-0.6	0.546	0.0223	0.0260	-0.28	0.779
Year 2006	0.1459	0.1906	-1.74	0.082	0.0595	0.0558	0.18	0.854
Year 2007	0.1882	0.1906	-0.09	0.93	0.2528	0.2119	1.12	0.262
Year 2008	0.2024	0.1600	1.6	0.109	0.2825	0.3160	-0.85	0.398
Year 2009	0.2918	0.2471	1.47	0.142	0.3420	0.3569	-0.36	0.718
Var_Earning[a]	-0.3994	-0.4267	0.36	0.718	-0.4751	-0.5717	1.03	0.305
Loss	0.1035	0.0988	0.23	0.82	0.1376	0.1190	0.64	0.52
Size[a]	16.7840	16.8970	-1.23	0.221	16.6860	16.5230	1.48	0.139
Portion[a]	0.2162	0.2522	-2.11	0.035	0.1911	0.1714	1.07	0.286
Leverage[a]	0.2733	0.2827	-0.69	0.492	0.2852	0.2457	2.55	0.011
TobinQ[a]	1.3857	1.3453	0.5	0.616	1.1900	1.2740	-0.96	0.337
Capex[a]	0.0543	0.0479	1.62	0.105	0.0563	0.0561	0.04	0.968

[a] Variables winsorised at the 1st and 99th percentiles.

Panel C: Regression result on the matched sample – Common Uncertainty

DV: Uncertainty Common	(1) FY1	(2) FY2	(3) FY3	(4) FY1	(5) FY2	(6) FY3
CED	**-0.8058*** **	**-0.8534*** **	**-0.6220*** **			
	(-3.60)	**(-3.61)**	**(-3.03)**			
CSR				**0.2626**	**0.0005**	**0.0247**
				(1.00)	**(0.00)**	**(0.10)**
Bribery	-0.0841	0.0441	-0.2912	0.8606**	0.7266	-0.0453
	(-0.29)	(0.13)	(-1.03)	(2.24)	(1.59)	(-0.12)
Cross Listing	-0.3829	-0.9835**	-0.1382	-0.0402	-0.0247	0.1277
	(-0.99)	(-2.17)	(-0.29)	(-0.08)	(-0.05)	(0.31)
Gov_Score	-0.0035	-0.0044	-0.0102*	-0.0005	0.0082	0.0069
	(-0.63)	(-0.70)	(-1.95)	(-0.07)	(1.02)	(1.04)
Roa	2.2676	3.5034	3.6159*	2.4129	4.5423	-1.0816
	(1.03)	(1.42)	(1.71)	(0.77)	(1.45)	(-0.48)
CSRIndex	-0.8142**	-0.0618	-0.4587*	-1.0512**	-0.2258	0.1455
	(-2.26)	(-0.16)	(-1.75)	(-2.17)	(-0.43)	(0.37)
ESI	0.3372	0.5404*	-0.0007	0.3424	0.5031	0.2552
	(1.05)	(1.71)	(-0.00)	(0.91)	(1.37)	(0.83)
Var_EAR	0.5385***	0.2544**	0.2588**	0.3177**	0.2401*	0.3003**
	(5.04)	(2.07)	(2.43)	(2.43)	(1.74)	(2.59)
Loss	-0.2289	-0.3041	0.0627	-0.5432	-0.2231	-0.7532
	(-0.46)	(-0.63)	(0.16)	(-0.90)	(-0.40)	(-1.56)
Size	0.0329	0.1022	0.1421	-0.0515	-0.1293	-0.2040*
	(0.32)	(0.90)	(1.57)	(-0.37)	(-0.92)	(-1.77)
Portion	0.7855*	1.0850**	1.0815**	1.5212**	1.1340*	1.0346*
	(1.65)	(2.14)	(2.49)	(2.41)	(1.78)	(1.85)
LEV	-1.1224	-0.5619	0.4879	-0.0346	0.6871	0.5439
	(-1.56)	(-0.66)	(0.82)	(-0.04)	(0.74)	(0.79)
TobinQ	-0.1138	-0.2274**	-0.1833**	-0.4682*	-0.6014**	-0.1931
	(-1.20)	(-2.16)	(-2.14)	(-1.93)	(-2.42)	(-1.24)
CAPEX	-5.9966**	-4.9123**	-2.7086	-4.7583**	-0.2990	-0.0498
	(-2.42)	(-2.40)	(-1.23)	(-2.38)	(-0.15)	(-0.03)
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Constant	6.4246***	5.2160**	1.9382	8.7110***	8.9263***	8.5276***
	(3.45)	(2.33)	(1.16)	(3.67)	(3.09)	(3.85)
Observations	850	850	850	538	538	538
Adjusted R^2	0.096	0.058	0.056	0.073	0.027	0.011
F	4.1897	2.6801	2.7039	3.7795	1.8467	1.2265

Table presents OLS regression results using matched sample (i.e. fweight = _weight) obtained through PSMatch procedure. Dependent variables is the Common level of Uncertainty as defined in paragraph 4.4. Independent variables are as described in Appendix A and B. *T* statistics in parentheses, Standard Error are clustered by firm. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively, using a two-tailed test. [a]Continuous variables winsorised at the 1st and 99th percentiles. Dependent variables is expressed in decile rank by year.

Panel D: Regression result on the matched sample – Overall Uncertainty

DV: Uncertainty All	(1) FY1	(2) FY2	(3) FY3	(4) FY1	(5) FY2	(6) FY3
CED	**-0.9061*** **	**-1.1629*** **	**-1.0507*** **			
	(-3.90)	**(-4.74)**	**(-4.37)**			
CSR				**-0.2705**	**-0.3050**	**-0.1708**
				(-0.94)	**(-1.00)**	**(-0.59)**
Bribery	-0.0983	0.0457	-0.4925*	0.2798	0.3902	-0.1071
	(-0.35)	(0.15)	(-1.66)	(0.78)	(0.95)	(-0.27)
Cross Listing	-0.3400	-0.7899**	0.0721	-0.6688	-0.3902	0.3333
	(-0.99)	(-2.17)	(0.18)	(-1.64)	(-0.83)	(0.66)
Gov_Score	-0.0001	0.0002	-0.0070	-0.0094	-0.0000	0.0009
	(-0.03)	(0.03)	(-1.25)	(-1.32)	(-0.00)	(0.13)
Roa	3.4325	3.1251	2.2705	4.6358*	3.5868	-0.0153
	(1.37)	(1.42)	(1.08)	(1.80)	(1.43)	(-0.01)
CSRIndex	-0.9649***	-0.5091	-0.4710	-0.6437	-0.1152	0.1921
	(-2.73)	(-1.20)	(-1.39)	(-1.20)	(-0.19)	(0.38)
ESI	0.9657***	1.1327***	0.8994***	0.2474	0.5883	0.4174
	(2.83)	(3.28)	(2.85)	(0.62)	(1.42)	(1.01)
Var_EAR	0.8208***	0.6242***	0.6153***	0.6072***	0.5638***	0.6514***
	(8.13)	(5.62)	(5.47)	(4.47)	(4.08)	(4.76)
Loss	1.4312***	1.0566**	0.7472*	1.3329***	1.1191**	0.6265
	(3.42)	(2.51)	(1.72)	(2.60)	(2.20)	(1.22)
Size	0.1729	0.1682	0.2577**	0.1660	0.0143	-0.0646
	(1.64)	(1.37)	(2.35)	(1.16)	(0.10)	(-0.47)
Portion	0.9860**	1.3305***	1.5171***	1.1128	0.9986	0.6565
	(2.00)	(2.60)	(3.06)	(1.54)	(1.37)	(0.95)
LEV	0.3307	0.2940	0.4766	0.4447	0.6787	0.2460
	(0.54)	(0.42)	(0.73)	(0.52)	(0.75)	(0.29)
TobinQ	-0.6560***	-0.5063***	-0.4398***	-0.9903***	-0.8860***	-0.5667***
	(-5.53)	(-4.41)	(-4.32)	(-4.55)	(-3.99)	(-3.17)
CAPEX	4.4842**	3.8748*	3.4953	6.9519***	7.6898***	7.4357***
	(2.18)	(1.93)	(1.60)	(3.37)	(3.56)	(3.55)
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Constant	3.0149	2.8462	1.2244	6.0864**	7.6489***	9.4020***
	(1.47)	(1.22)	(0.58)	(2.31)	(2.67)	(3.84)
Observations	850	850	850	538	538	538
Adjusted R^2	0.275	0.203	0.184	0.234	0.187	0.160
F	13.9042	8.5154	8.5432	8.0151	6.5874	5.7322

Table presents OLS regression results using matched sample (i.e. fweight = _weight) obtained through PSMatch procedure. Dependent variables is the Overall level of Uncertainty as defined in paragraph 4.4. Independent variables are as described in Appendix A and B. *T* statistics in parentheses, Standard Error are clustered by firm. ***, **, * Denote significance at the 1%, 5%, and 10% percent levels, respectively, using a two-tailed test. [a]Continuous variables winsorised at the 1st and 99th percentiles. Dependent variables is expressed in decile rank by year.

Figure 1: Analysts accuracy timetable